

IN THE CIRCUIT COURT OF  
THE ELEVENTH JUDICIAL CIRCUIT  
IN AND FOR DADE COUNTY, FLORIDA  
GENERAL JURISDICTION DIVISION

NORMA R. BROIN, et al.,  
Plaintiffs,

vs.

CASE NO. 91-49738  
CA 22

PHILIP MORRIS COMPANIES,  
INC., et al.,  
Defendants.

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TRIAL  
VOLUME 65

TRANSCRIPT OF PROCEEDINGS in the  
above-styled cause before the Honorable Robert Paul  
Kaye, at the Dade County Courthouse, 73 West Flagler  
Street, Miami, Florida, on Thursday, July 31, 1997,  
at 1:45 p.m.

APPEARANCES:

STANLEY M. ROSENBLATT, ESQ.

SUSAN ROSENBLATT, ESQ.

On behalf of the Plaintiffs

HUGH R. WHITING, ESQ.

JONES DAY REAVIS & POGUE

On behalf of R.J. Reynolds

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JEFFREY L. FURR, ESQ.  
WOMBLE, CARLYLE, SANDRIDGE & RICE  
On behalf of R.J. Reynolds  
EDWARD A. MOSS, ESQ.  
ANDERSON MOSS SHEROUSE & PETROS  
On behalf of Brown & Williamson  
MICHAEL RUSS, ESQ.  
KING & SPALDING  
On behalf of Brown & Williamson  
DAVID L. ROSS, ESQ.  
GREENBERG TRAURIG, et al.  
On behalf of Lorillard  
DAVID HARDY, ESQ.  
WALTER COFER, ESQ.  
BILLIE R. RANGLES, ESQ.  
MARTHA WARREN, ESQ.  
SHOOK HARDY & BACON  
On behalf of Lorillard and Philip Morris  
JOSE MARTINEZ, ESQ.  
MARTINEZ & GUTIERREZ  
On behalf of Philip Morris  
BARRY DAVIDSON, ESQ.  
COLL DAVIDSON CARTER SMITH SALTER & BARKETT  
On behalf of Philip Morris  
KELLY ANNE LUTHER, ESQ.  
CLARKE SILVERGLATE WILLIAMS & MONTGOMERY  
On behalf of Liggett and Brooke Groups  
JOSEPH R. MOODHE, ESQ.  
DEBEVOISE & PLIMPTON  
On behalf of The Council for Tobacco Research  
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1 THE COURT: Before you bring out the  
2 jury, what are we going to be doing so we know for  
3 sure?  
4 MR. ROSENBLATT: Dr. Bookstein, who is  
5 my first witness, he's a statistician.  
6 THE COURT: No motions?  
7 MR. HARDY: No.  
8 THE COURT: Let's get the jury out  
9 here.  
10 THE BAILIFF: Jurors entering the  
11 courtroom.  
12 (The following proceedings were had within  
13 the hearing of the jury.)  
14 THE COURT: Have a seat, folks. Call  
15 your next witness.  
16 MR. ROSENBLATT: Dr. Bookstein.  
17 Judge, the juror's raising his hand.  
18 THE CLERK: They need a pad.  
19 FRED L. BOOKSTEIN, Ph.D.,  
20 having been first duly sworn, was examined and  
21 testified as follows:  
22 MR. ROSENBLATT: Shall I wait on that?  
23 THE COURT: If it's necessary.  
24 Let's proceed.  
25 DIRECT EXAMINATION  
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1 BY MR. ROSENBLATT:

2 Q. Dr. Bookstein, tell the jury, please, your  
3 full name and your present professional address.

4 A. I'm Fred Leon Bookstein. I live in  
5 [DELETED]. I'm employed at the University of  
6 Michigan in Ann Arbor.

7 Q. I'm calling you doctor, but you're not an  
8 M.D. You're a different kind of doctor which I'll  
9 get to.

10 A. Yes.

11 Q. Okay. Because the jurors heard mainly from  
12 M.D.s thus far.

13 Let me take you through your academic  
14 history. I've got your curriculum vitae in front of  
15 me.

16 You received a Bachelor of Science in  
17 mathematics from the University of Michigan in what  
18 year?

19 A. 1966.

20 Q. And tell us about the additional formal  
21 education you had after having gotten your  
22 undergraduate degree in mathematics from the  
23 University of Michigan.

24 A. From the University of Michigan, I went to  
25 Harvard University as a graduate student first in

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1 mathematics and then in what was called, at the  
2 time, social relations but became sociology.

3 I received a Master's degree in sociology in  
4 1971, and rather than completing the doctorate  
5 there, went to work as a computer programmer at the  
6 Harvard School of Public Health for about two years.

7 In 1974, I moved back to the University of  
8 Michigan as what is called a junior fellow, which is  
9 a sort of a graduate student, although without a  
10 department. And as a junior fellow I received my  
11 doctoral degree in statistics and zoology in 1977.

12 Q. Now, having a Doctor of Philosophy degree in  
13 the field of statistics, does that mean you're a  
14 statistician?

15 A. I'm mostly a statistician. The degree is in  
16 statistics and zoology, which was a way of providing  
17 an emphasis in biology, rather, than more than other  
18 kinds of statisticians who work in engineering or  
19 economics, for instance.

20 Q. Okay. I think that when most people think  
21 of the field of statistics, it obviously represents  
22 numbers to them. So what is the connection, if any,  
23 between statistics and zoology or between statistics  
24 and biology, at least insofar as your career is  
25 concerned?

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1       A.   Well, there are two connections because  
2   there are two related senses of the word  
3   "statistics" that come up here.  One kind of  
4   statistics is the numbers the government collects,  
5   like births and marriages and rates of lung cancer  
6   per hundred thousand people.

7           And many of those statistics are --  There  
8   is also the kind of statistics that is part of  
9   scientific research in which people will measure  
10  numbers and look for patterns in the numbers and try  
11  to associate those patterns with reasons that the  
12  numbers came out the way they did.

13          If the measurements are of biology creatures  
14  or of medical concerns, healthy people or sick  
15  people, then, the statistics are associated with  
16  biology.  That combination is often called  
17  biostatistics.  And I have an appointment in the  
18  Department of Biostatistics at the University of  
19  Michigan, among other appointments.

20       Q.   And what is the focus of biostatistics?

21       A.   Biostatistics is the application of  
22  statistical methods, like the ones I'll be talking  
23  about later today, to studies of growth and  
24  development and health and disease, mostly in  
25  individuals.  And then there is a closely related

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1 field called epidemiology. That's the study of  
2 mostly diseases in populations, rather, more than  
3 individuals.

4 Q. Okay. In going down your curriculum vitae,  
5 let me -- obviously I'm not going to cover each and  
6 every item, but I want to ask you some specific  
7 questions about certain of the items that appear  
8 here.

9 You were a senior data analyst at the Health  
10 Sciences Computing Facility at Harvard University  
11 School of Public Health from 1972 to 1974. Tell us  
12 about that.

13 A. That was the job I took after I had received  
14 a Master's degree in sociology. In the early 1970s,  
15 there were no personal computers. If you were going  
16 to use a computer in health research, you would be  
17 usually running at what is called a mainframe, which  
18 is the kind of machine now that only large insurance  
19 companies, for instance, and the government have.

20 And I was one of two or three people who was  
21 employed to assemble databases of ongoing projects  
22 in forms such that statistical questions can be  
23 answered to interrogate these databases about the  
24 questions by typing on punch cards that hardly any  
25 of my students now remember. You remember punch

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1 cards which are about so long, so high, have holes  
2 in them. And to help write the papers, the  
3 scientific papers, that reported the findings. That  
4 was the job of senior data analyst.

5 Q. Okay. You're a professor presently at the  
6 University of Michigan?

7 A. No. I do not have the title of professor.

8 Q. What is your title?

9 A. I have a title of distinguished research  
10 scientist.

11 Q. And what exactly does that mean and when did  
12 you first get that title?

13 A. I got that title in 1989 when it was created  
14 at the university. At the moment there are three of  
15 us. It is intended to be a description of someone  
16 like a professor but whose job is full-time  
17 research. I teach, as I please, only to small  
18 classes, and I pick my own research problems.

19 As I say, I was one of the first people to  
20 get that title, and I've had it for eight years now.

21 Q. Now, and that is your formal official title  
22 at the University of Michigan, distinguished  
23 research scientist?

24 A. Probably it's distinguished research  
25 scientist in the Institute for Gerontology.

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1 Q. And what are the primary areas of research  
2 that you have been involved in within the past few  
3 years?

4 A. I work mostly in three areas.

5 The first, which is the one that uses the  
6 most computers, is studies of brain shape, shapes of  
7 human brains, using data you get from x-rays and  
8 concentrating on the way that that shape is  
9 different or grows differently in people who have  
10 mental illnesses of various types.

11 A second area is the study of -- I'd have to  
12 call it where numbers come from, the logic of  
13 numerical measurement, the logic of statistics and  
14 the way in which you pull patterns out of data and  
15 use them to make explanations of scientific  
16 processes. And that's the area where my teaching  
17 concentrates.

18 The third area is work on systems that have  
19 subtle effect at work, slow processes of change or  
20 small processes of change. And I've invented a  
21 method something like the meta-analysis we will be  
22 talking about here today that I've applied to  
23 studies of child development and to studies of  
24 aging.

25 I also work on the research responsibility

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1 curriculum in Michigan, which is a program just  
2 created that tries to train graduate students all  
3 across the university in what it means to conduct  
4 your science properly and ethically these days.

5 Q. Now, Dr. Bookstein, in practical terms, when  
6 you say one of your research areas involves the  
7 study of brain shape as it relates to mental  
8 illness, of what practical significance is that  
9 research? What is it directed toward accomplishing?

10 A. One way of thinking about it is if you're  
11 doing a study of people with a particular mental  
12 illness -- I've been working lately on  
13 schizophrenia -- you will get x-rays of patients who  
14 have that diagnosis and x-rays of patients who don't  
15 have that diagnosis, and my job is to try to find  
16 out what, if anything, is different between those  
17 two piles of x-rays.

18 Over the years I've invented a lot of  
19 methods that can be used for data like that for data  
20 from x-rays. And in this particular case,  
21 schizophrenia, I've come up with a new kind of  
22 measurement that looks like it might be useful  
23 perhaps for deciding what children are likely to be  
24 at risk of schizophrenia, which is a very important  
25 problem because schizophrenia is a fairly common

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1 disease.

2 Q. Now, as I go through your many publications,  
3 obviously some of your writings have appeared in  
4 journals having to do with medical imaging and  
5 biology, and I know you're a statistician, so what  
6 is the relationship between what you do in the  
7 medical field --

8 A. Most --

9 Q. -- and the x-ray field?

10 A. Well, most of my papers in the brain area  
11 are now appearing in journals of medical image  
12 analysis. Not journals about geometry or journals  
13 about pictures in general, although those exist, but  
14 journals about pictures of brains or pictures of  
15 hearts or pictures of the bones of the face, which  
16 is another area that these methods also apply in.

17 Some of the articles will appear in journals  
18 of statistics. Those articles tend to be the ones  
19 that have too many formulas.

20 Q. Now, as I look at your curriculum vitae, the  
21 word "morphometrics" appears a lot. What is  
22 morphometrics?

23 A. Well, it's a word I think I made up from my  
24 dissertation 20 years ago. Morpho kind of means  
25 shape and metrics is as in metric system, measuring

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1 things.

2 Morphometrics is the set of techniques and  
3 formulas and tricks for measuring the shape of  
4 things, like the shape of a face or the shape of a  
5 brain, and doing statistics on that.

6 If you want to think of it as a way of using  
7 graph paper that's put down over a picture, that's  
8 not a bad example. Ways of taking the numbers, the  
9 points out of the graph paper and arranging them or  
10 describing how they are different between groups.

11 Morphometrics is the statistics of biological shape.

12 Q. Now, you had a grant with the title of which  
13 is "Orthodontic Treatment Effects on Craniofacial  
14 Growth." Tell us about that in every-day language,  
15 because the title is not in every-day.

16 A. The title is formidable. The first kind of  
17 data that I was paid to work on after I got my  
18 degree is data from orthodontics, which orthodontics  
19 is moving the teeth around. But one of the things  
20 that you do as an orthodontist is try to see that  
21 the bones of the face are going to grow in the right  
22 way. You don't want the person to end up with a jaw  
23 he doesn't like, for instance, after the end of  
24 expensive treatment.

25 So I was using my techniques to describe

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1 what happened to the growing faces of people who  
2 were being given different kinds of orthodontic  
3 treatment. And orthodontics, as I said, moves the  
4 teeth around with wires and splints and braces.

5 The techniques worked fairly well there,  
6 this kind of graph paper-related technique. But the  
7 findings weren't terrifically important in that  
8 there wasn't that much the orthodontist could  
9 actually do about growing the jaw. So lately we  
10 have been applying these same methods to data about  
11 surgery using things like saws instead of wires.

12 Q. Now, a patent is listed here determining  
13 cardiac wall thickness and motion by imaging and  
14 three-dimensional modeling. Is that something you  
15 have a patent on?

16 A. I'm one of eight people. The other seven  
17 are at the University of Washington in Seattle, who  
18 a few years ago figured out a way to apply some of  
19 my techniques to x-ray pictures of the beating  
20 heart, the live heart. One of the main problems in  
21 cardiology is trying to describe if the heartbeat is  
22 normal or abnormal.

23 Cardiologists will often try to decide that  
24 by looking to see how the heart is moving in the  
25 x-ray from the start of the beat to the middle of

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1 the beat and back from the lub to the dub, lub, dub.  
2 But it turns out there are better ways of  
3 measuring that, in effect, better ways of using the  
4 graph paper that actually measure how the muscle of  
5 the heart is actually getting thinner and thicker.

6 And that patent is for a combination of  
7 formulas and electronic equipment that might some  
8 day be able to do those measurements on the real  
9 beating heart in real patient care.

10 Q. Let me ask you some questions about courses  
11 that you actually teach to students at the  
12 University of Michigan. One course is called  
13 College Honors 252, Numbers, Reasons and Data.

14 First of all, who is that course taught to,  
15 at what level of the students?

16 A. That's a course for freshman, undergraduate  
17 freshman and not just scientists. It's a course for  
18 any freshman at the University of Michigan who has  
19 been puzzled about where numbers come from.

20 It's not just that you grew up counting your  
21 fingers; there are some rules about how you can  
22 apply numbers to things in the world, like the  
23 length of this bar, the length of the courtroom.  
24 And there's been a long history of how people came  
25 to understand what those rules were, when you can

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1 apply them and when you can't.

2 Eleven years ago I thought that this might  
3 be a nice idea for a course. It had never been  
4 taught before, so I just sort of invented a  
5 syllabus, got permission to teach it and I've been  
6 teaching it every other semester ever since.

7 Q. In terms of teaching models in that  
8 particular course, have you had occasion to use the  
9 1993 report of the United States Environmental  
10 Protection Agency?

11 A. Yes. In 1993 a copy of that came to my  
12 attention from a friend at the University of  
13 Michigan, and I quickly recognized that it was one  
14 of the best examples I had ever seen of a careful,  
15 essentially correct scientific argument about the  
16 use of numbers in a major public health question,  
17 this question of environmental tobacco smoke and  
18 lung cancer.

19 So I went through the report to find what  
20 parts of it I might be able to use with my class and  
21 ended up then, and every year after that, handing  
22 them out copies of chapter one and chapter five and  
23 teaching for a week, sometimes two weeks, about how  
24 those chapters put numbers together and how it  
25 related to other kinds of rather difficult

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1 scientific studies that had to overcome similar  
2 problems.

3 Q. Now, this is Plaintiffs' Exhibit 0888, the  
4 report of the United States Environmental Protection  
5 Agency?

6 A. Actually, I use the white one.

7 Q. This one?

8 A. Which is the same report.

9 Q. And I think it has the same number?

10 A. Yeah.

11 Q. I'm not, at this point, Dr. Bookstein,  
12 asking you to go through it, but that's the teaching  
13 device that you use in that particular class?

14 A. Yes.

15 Q. And have used since 1993, correct?

16 A. Yes. '94, actually. I got this in '93.  
17 The next time I taught the course was in '94.

18 Q. Now, at the time that you first began to use  
19 the report of the United States Environmental  
20 Protection Agency, did you know anything about this  
21 lawsuit?

22 A. No.

23 Q. Did you know anything about me?

24 A. No.

25 Q. Now, again, without going through the

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1 various symposiums that you've conducted in  
2 different parts of the United States and in several  
3 foreign countries, and without going through or  
4 attempting to go through all your articles, tell us  
5 about any books that you've actually written or  
6 chapters in book of other academics.

7 A. Okay. I have five books on my resume. One  
8 of them was my dissertation which was published.  
9 That was a long time ago.

10 Q. Just so that's clear, in other words, before  
11 someone can get a Ph.D. in a given field, like your  
12 field is statistics and zoology, it's ordinary to do  
13 a thesis?

14 A. Yes.

15 Q. Or a dissertation; they are used  
16 interchangeably?

17 A. Yes.

18 Q. Tell us how that works and who passes on the  
19 acceptability of the dissertation.

20 A. After one has been a graduate student for a  
21 while, one takes exams in whatever field one is  
22 going into. In my case, I was going into two  
23 fields, statistics and zoology, so I took two sets  
24 of exams.

25 And then from the faculty at your school you

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1 get -- you choose -- I choose -- I chose, a list of  
2 professors who might be interested in what I had  
3 decided to work on, which was, in this case,  
4 biological shape. That's called my committee of, in  
5 this case, two statisticians and two zoologists.

6         You take some time, in my case a couple of  
7 years, and write something that's the length of a  
8 medium-sized book called a thesis or a dissertation,  
9 which is supposed to be an original solution to some  
10 kind of scientific problem, usually a fairly small  
11 one.

12         In my case it was one attempt at this  
13 problem of how you measure shape, how you measure it  
14 for purposes of averaging or comparing, with some  
15 applications to orthodontics, actually.

16         That book is read by the four people on your  
17 committee who either let you or do not let you be  
18 approved for the degree of Doctor of Philosophy.

19         It's not too common that it actually gets  
20 published also as a book, and in my case the next  
21 year it was published.

22         Q.   And what are some of your other books that  
23 you've had published?

24         A.   In 1991 I wrote a big book called  
25 "Morphometric Tools for Landmark Data," which is a

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1 summary of the techniques that I invented until that  
2 time for analyzing shape. These things related to  
3 graph paper that I was talking about.

4 To my surprise, because that's a rather big  
5 book and a rather difficult book, they just printed  
6 it again five years later. So it's in print again,  
7 and there is a paperback edition. This is, as I  
8 say, unusual.

9 Two years after that, I wrote a book about  
10 the effects of alcohol on child development. And  
11 that book has just gone through its first printing,  
12 and the publisher is trying to decide whether that  
13 one should be printed again.

14 Q. What is it about the expertise of a  
15 statistician such as yourself that enables you or  
16 puts you in a position to make a judgment on the  
17 accuracy or overall validity of the report of the  
18 United States Environmental Protection Agency?

19 A. Much of this report is what is called a  
20 meta-analysis. And the rules of meta-analysis are  
21 the rules of statistical reasoning. A meta-analysis  
22 is the combination of numbers to draw conclusions in  
23 a way I'll talk about in a while.

24 And the way those rules are applied is not  
25 specific to the topic of this report. It's not

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1 specific to environmental tobacco smoke. It's not  
2 specific to lung cancer. These are general rules of  
3 deciding if a pattern is present or not in a data  
4 set and if numbers have a -- have the appearance of  
5 supporting a scientific interpretation.

6 Q. Now, Dr. Bookstein, were the conclusions of  
7 the Environmental Protection Agency, in that report  
8 that you use in the course that you've discussed,  
9 that secondhand smoke is a Class A carcinogen, that  
10 secondhand smoke causes lung cancer in healthy  
11 non-smokers, and that secondhand smoke is  
12 responsible for approximately 3,000 lung cancer  
13 deaths annually in American non-smokers, were those  
14 conclusions determined in accordance with sound  
15 statistical standards and principles?

16 MR. FURR: Excuse me, Dr. Bookstein.  
17 Objection, Your Honor. This is beyond the scope of  
18 the deposition.

19 THE COURT: Sidebar.

20 (The attorneys and the court reporter  
21 approached the bench and the following proceedings  
22 were held outside the presence of the jury.)

23 MS. ROSENBLATT: This, by the way, was  
24 the disclosure prior to the deposition.

25 THE COURT: Tell me --

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1           MR. FURR: Your Honor will recall this  
2 is the witness that was the subject of your ruling  
3 yesterday. His testimony he gave in the  
4 deposition -- during his deposition on May 8 on page  
5 120, he indicated that he had no opinion as to  
6 whether EPA had properly established that ETS  
7 exposure causes lung cancer in non-smokers. He  
8 indicated on --

9           MR. ROSENBLATT: That's not the  
10 question.

11           MR. FURR: He indicated on page 112  
12 that he had no opinion about the validity of the  
13 EPA's calculation of the population attributable  
14 risk, which is the 3,000 death number that  
15 Mr. Rosenblatt just referred to. And he indicated  
16 he had no ability as a statistician to determine  
17 whether or not ETS had been demonstrated to be a  
18 cause of lung cancer.

19           So all three of the components of the  
20 question that Mr. Rosenblatt just asked him are  
21 issues that he indicated that he had no opinion on  
22 during his deposition.

23           All that he had an opinion on during his  
24 deposition was whether or not the EPA had applied a  
25 mathematically valid, reasonable approach. He could

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1 not vouch for the conclusions because, among other  
2 reasons, he hadn't looked at those studies  
3 underlying the analysis.

4 MS. ROSENBLATT: Your Honor, he  
5 prepared -- the deposition will reflect that the  
6 witness prepared this disclosure. He said this is  
7 accurate, and the specific sentence is that the  
8 conclusions are valid. This is the expert -- this  
9 is a supplement to the expert disclosure prior to  
10 his deposition. He said to us, and this is in the  
11 deposition --

12 THE COURT: This was given to the  
13 defense?

14 MS. ROSENBLATT: Yeah, they asked him  
15 questions on this. He prepared this. He sent this  
16 and faxed this to our office. We then, before the  
17 deposition, changed it. And I think it's the bottom  
18 of the second paragraph where he says, "The  
19 conclusion" -- excuse me, I'm not finished yet.  
20 "The conclusions reached by the EPA are valid."  
21 That was his opinion.

22 And he did not -- he did since review all  
23 the underlying studies. He was asked questions  
24 about the validity of the underlying studies and  
25 said, "I hadn't done it." He's done it since. He

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1 is not going to get into it unless the door's open.  
2 THE COURT: What are we talking about,  
3 the validity? I understand what you're saying.  
4 When you say validity of the study, that cancer  
5 causes -- or that smoking causes cancer or that the  
6 numerical statistical analysis --

7 MR. ROSENBLATT: Methodology.

8 THE COURT: Methodology.

9 MR. ROSENBLATT: That's the key.

10 THE COURT: Forgetting what the results  
11 are.

12 MS. ROSENBLATT: Not exactly. It's his  
13 opinion the conclusions reached by the EPA are  
14 valid.

15 THE COURT: And he says it here.

16 MS. ROSENBLATT: He says that. And he  
17 said in his depo -- what he said in his depo was  
18 that he had not, at that time, reviewed the  
19 underlying studies to then -- liking to the raw data  
20 and make sure the raw data was correct. He --

21 THE COURT: If he says, for instance,  
22 that the methodology used to reach point X is valid,  
23 then he assumes that X is valid, that's what he is  
24 saying?

25 MR. ROSENBLATT: Correct.

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1 THE COURT: Okay.

2 MR. FURR: That's an interesting  
3 statement, but that's not what he testified to on  
4 his deposition. He testified in his deposition the  
5 way that I just described his testimony.

6 THE COURT: He doesn't have an opinion  
7 on the validity of the actual findings regarding  
8 cancer. I guess that's what you're talking about.  
9 Show me what you're talking about here.

10 MR. FURR: He said a number of things.  
11 One component of the question Mr. Rosenblatt asked  
12 him was the population attributable risk, the 3,000  
13 number.

14 THE COURT: He said the figures. The  
15 method used to reach that conclusion is what he's  
16 talking about. I think we are talking about  
17 methodology right now.

18 MS. ROSENBLATT: He's also talking  
19 about the EPA report.

20 THE COURT: Let me see.

21 MR. FURR: For instance, on page 112,  
22 line 19 through 23, I asked him the question:

23 "QUESTION: Is it correct you're expressing  
24 no opinion today on the validity of the EPA's  
25 calculations of population attributable risk for ETS

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1 exposure?

2 "ANSWER: That's correct."

3 THE COURT: What does that mean to me?

4 MR. FURR: That's the 3,000 death  
5 number. That's one example.

6 He also was asked whether he was expressing  
7 an opinion on whether ETS -- whether the  
8 Environmental Protection Agency had demonstrated  
9 that the -- that environmental tobacco smoke caused  
10 lung cancer in non-smokers. He said, "I have an  
11 opinion on the reasoning that they employed but not  
12 on the ultimate conclusion."

13 THE COURT: Yeah, okay.

14 MS. ROSENBLATT: It's, to some extent,  
15 a matter of semantics. I think the distinction here  
16 in what he's precluded from testifying, based on  
17 Your Honor's earlier ruling, he assumed that the  
18 analysis done -- and there were many, many charts in  
19 the EPA report that have conclusions based upon  
20 individual studies. He assumed they were valid. He  
21 did not look at the raw data of the studies, so  
22 based on that, the conclusions reached are valid.

23 THE COURT: Let's talk about  
24 methodology. Let's talk about the method used by  
25 the EPA report, a valid method, and whatever

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1 conclusions reached we can give to somebody else.

2 MR. ROSENBLATT: I won't repeat them.  
3 He's a Ph.D. in statistics. He's used the EPA  
4 report in his teaching, and the objection is they  
5 were surprised by his testimony, obviously.

6 MS. ROSENBLATT: It's a very important  
7 part of his testimony, that based on the numbers  
8 they used, the conclusions are valid.

9 THE COURT: Based on the numbers and  
10 you're talking numbers. If he's talking numbers  
11 only and not anything else, that may come into  
12 effect. The chemical -- I don't know how they reach  
13 these conclusions about cancer.

14 MS. ROSENBLATT: They extrapolate --  
15 they take information from lot of different, various  
16 studies, combine them together. You look at the  
17 numbers and you reach statistical conclusions.

18 THE COURT: If he's going to say that  
19 if the method used is a correct method, the end  
20 result using of that method is valid unless  
21 something else interferes with it, I don't know --

22 MR. FURR: I think all he can say is  
23 almost the opposite. All he can say is if the EPA's  
24 analysis of the studies was correct, then the  
25 statistical methods by which they combined the data

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1 was an appropriate way to do it. That's all he  
2 says.

3 MS. ROSENBLATT: He stated in his  
4 deposition and he stated in his disclosure, which he  
5 said he prepared in his deposition, that the  
6 conclusions reached by EPA is valid.

7 THE COURT: That's not what he said  
8 when he was asked the question.

9 MR. ROSS: Where?

10 THE COURT: Show me where then.

11 MS. ROSENBLATT: He was in different  
12 parts. He was asked about this particular  
13 disclosure.

14 MR. ROSS: It's not relevant.

15 MS. ROSENBLATT: That's  
16 cross-examination, Your Honor. They are picking one  
17 sentence out.

18 THE COURT: The point is this: If he  
19 said something to that effect in his deposition,  
20 maybe he was consistent in one part as related to  
21 another, but it's not as if this was something that  
22 he didn't tell them about.

23 What I was concerned about on the ruling  
24 after the deposition, went back and did some  
25 additional studies, and that's the only thing that

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1   bothered me.

2                   MS. ROSENBLATT:  Let me see.  I think  
3   it might be here.

4                   THE COURT:  That's not the situation  
5   here apparently.

6                   What I'm doing, I really don't need that.  
7   Relegating his testimony to that covered in the  
8   deposition, and if at one part of the deposition  
9   says he didn't or can't, whatever it might be or  
10  whatever page it was, and another part says that it  
11  did, that's an inconsistency they can bring out on  
12  cross; but it's not an area that weren't talked  
13  about or weren't disclosed to and after the  
14  deposition make some other findings or conclusions  
15  or changes.

16                  So in that regard, I'll overrule the  
17  objection.

18                  MR. ROSS:  Let me state one objection  
19  that has nothing to do with that objection, and that  
20  is this:  I believe it is improper to call an expert  
21  to do nothing but bolster the credibility of someone  
22  else's opinion by saying, "I've read that opinion  
23  and I think it's correct."

24                  Your Honor has allowed the EPA report in  
25  over our objection.  We are not going back on that.

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1 We think it's a hearsay document, but now what we  
2 have is an expert who is not saying, "Look, I did a  
3 study and this is my opinion of something," he said,  
4 "I'm just read their study."

5 THE COURT: You're attacking it and  
6 how --

7 MR. ROSS: We haven't put our case on  
8 yet.

9 THE COURT: You attacked it on  
10 cross-examination.

11 MR. ROSS: There may be something  
12 appropriate for a rebuttal case when our case is  
13 done, but now all they are doing in their own case  
14 before we have put a case on, calling one expert to  
15 come in and say that other expert is correct, and  
16 that's not proper.

17 MS. ROSENBLATT: We had an opening  
18 statement that talked quite a bit about that, the  
19 cherry picking and the attack and the methodology  
20 was wrong.

21 MR. ROSS: There are constant responses  
22 from the Plaintiff about this is what they are going  
23 to do, this is what they are going to do. We  
24 haven't put our case on yet.

25 MS. ROSENBLATT: That's what they said

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1 they were doing in opening statement. They listed  
2 three statisticians as experts.

3 MR. ROSS: Until we put a case on and  
4 attack something specific with some testimony, there  
5 is nothing to rebut by having one expert just come  
6 on and say that expert's correct.

7 MS. ROSENBLATT: So I wonder what is  
8 going to happen when we start bringing rebuttal  
9 witnesses in, if we were to bring one. For example,  
10 Dr. Huber, I'm sure they are going to say you should  
11 have put them on in your case in chief.

12 THE COURT: We are talking about  
13 methodology and reaching certain conclusions. Let's  
14 find out what the methodology is. That's what we  
15 are talking about, how do they reach this point.

16 MR. FURR: May I show you two other  
17 things I think you need to understand. This may  
18 come up over and over, how limited this witness'  
19 testimony was in his deposition.

20 When -- Your Honor may recall that this  
21 updated disclosure Ms. Rosenblatt is holding was  
22 handed to me in the middle of the deposition, so I  
23 attempted to examine him why disclosure had been  
24 changed like it was. And on page 27 he said, "I was  
25 concerned to make it clear that I did not know much

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1 about tobacco. In fact, that I have no professional  
2 knowledge at all about ETS, that my knowledge is as  
3 a statistician, an applied statistician."

4 THE COURT: I think the jury  
5 understands we are talking numbers. Okay.  
6 Overruled.

7 (The following proceedings were had in the  
8 presence of the jury.)

9 Q. (By Mr. Rosenblatt) Dr. Bookstein, I'm going  
10 to ask you a somewhat shortened version of the  
11 question that I had asked before we had the sidebar  
12 with the judge.

13 Were the conclusions of the Environmental  
14 Protection Agency, in terms of the numbers, in terms  
15 of the statistics, in terms of the methodology, were  
16 those conclusions determined in accordance with  
17 sound statistical standards, principles and  
18 methodology?

19 A. Yes, they were consistent with  
20 statistical -- sound statistical standards and  
21 principles in all respects.

22 Q. Is that your opinion based upon reasonable  
23 scientific and statistical probability, the opinion  
24 you just expressed?

25 A. I'm not sure I understand the question. It

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1 is based on all of my training and all of the  
2 rules -- the word "probability" doesn't really come  
3 into it.

4 Q. Okay. Now, when I contacted you about being  
5 a witness in this case, I asked you to analyze the  
6 EPA report and the various methodologies that this  
7 agency employed in reaching its conclusions.

8 And that's what I would like for you to  
9 explain to the jury now, how you went about  
10 analyzing the various methodologies used by the EPA  
11 people in arriving at their ultimate conclusions.

12 A. Okay. At the beginning I checked in three  
13 general areas, and then I explored some criticism of  
14 the report in several additional areas.

15 The areas that I checked in at the beginning  
16 were the significance tests, analysis of covariates  
17 and principles of meta-analysis.

18 Q. Let's take it one by one, how you went about  
19 analyzing the significant tests.

20 A. All right. There are four that I have  
21 particularly in mind. Let me take them, in effect,  
22 in the order in which the text presents them.

23 A meta-analysis is a collection of papers on  
24 a similar sort of subject, in this case separate  
25 studies of the effects of tobacco smoke on health

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1 outcomes, a collection of those papers, by taking  
2 the numbers out of them, putting them into tables  
3 and then summarizing those tables and carrying out  
4 statistical tests of those tables.

5         So one kind of summary. And the EPA found  
6 30 papers worldwide that it was going to be using  
7 for its review -- 30 papers on the connection  
8 between environmental tobacco smoke and lung cancer  
9 among non-smoking women.

10         The first statistic that the EPA presented  
11 was the fraction of those studies in which the  
12 apparent effect of environmental tobacco exposure on  
13 the rate of getting lung cancer in non-smoking women  
14 was bad; that there was an apparently higher rate of  
15 lung cancer in non-smoking women married to smokers  
16 than in non-smoking women married to non-smokers.

17         Twenty-four of the thirty studies showed  
18 that lung cancer was bad in that sense.

19         The way you should think about that number,  
20 24 out of 30, is rather the way you would think  
21 about children born in the obstetrics ward of a  
22 hospital. If some weeks there were 30 children born  
23 and 24 of them were boys, you expect 15 of them to  
24 be boys, half the studies.

25         If you get 24 of them boys, there is a

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1 formula, a standard formula in the statistics books,  
2 that tell you how often that would happen. If  
3 really you were supposed to be getting fifty -- half  
4 of each.

5 In the case of this number, 24 out of 30,  
6 the value of the formula gives you for the  
7 probability that you could get 24 boys out of 30, 24  
8 positive studies out of 30, is about one in a  
9 thousand.

10 And that's the kind of thing that, in  
11 general, is called a significance test, coming up  
12 with a probability that you could have gotten the  
13 numbers you actually got by chance.

14 So the EPA concluded that the probability of  
15 getting that result, 24 out of 30 positive studies  
16 by chance, was about one in a thousand. They  
17 reported it as a 99.9 percent -- I've forgotten the  
18 word they used. Possibly confidence.

19 MR. FURR: Excuse me, Dr. Bookstein.  
20 This has become a recitation of hearsay at this  
21 point.

22 THE COURT: Overruled.

23 THE WITNESS: Also, while preparing for  
24 my deposition, I reviewed additional studies in the  
25 California EPA report which did not alter that

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1 probability.

2 Q. (By Mr. Rosenblatt) Now, did you  
3 specifically look for flaws in the methodologies  
4 used, such as the EPA's meta-analysis?

5 A. Yes, I did. That was the third thing on my  
6 list. There are principles of meta-analysis that  
7 are used generally by statisticians in all of the  
8 areas where it's used. Those areas include a lot of  
9 other branches of medicine, some of the social  
10 sciences and so forth.

11 It's hard to note exactly how many of those  
12 principles are because of the way that they are put  
13 together, different from textbook to textbook. But  
14 in general, they require that you systematically  
15 search a literature for the articles that you're  
16 going to be reviewing, that you have very explicit  
17 rules for what articles you're not going to use once  
18 you decide that you've got a list to start from.

19 They recommend that you assess the quality  
20 of these studies before you read the findings of the  
21 studies, that you decide how good a study it is only  
22 given the description of the methods that the  
23 researchers are using, not the numbers they come up  
24 with.

25 They suggest that you have a reasonable set  
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1 of ways to put your data together into subsets, the  
2 way the EPA did by country, and also by kind of  
3 study. And then they recommend a certain sort of  
4 variety in the studies that you find and collect.  
5 They shouldn't be all the same, and they shouldn't  
6 be too different.

7 Usually what they say is studies should  
8 have -- be interested in similar kinds of  
9 comparisons, in this case lung cancer rates among  
10 wives of smokers and lung cancer rates among wives  
11 of non-smokers.

12 But they should be varied in other things  
13 like country or average fraction of smokers among  
14 the population or their study design, case control  
15 versus cohort.

16 In my opinion, the EPA was quite competent  
17 in its carrying out all of those design standards in  
18 its meta-analysis.

19 Q. Now, did you consider the issue of  
20 confounders?

21 A. Yes, I did. The EPA itself did not do any  
22 analysis of what are called confounding factors.

23 Q. Such as what are confounding factors?

24 A. A confounding factor -- here's how to think  
25 of a confounding factor. If you're doing a study of

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1 one condition and a bad outcome -- so as not to use  
2 the example from this trial, I'll use spina bifida,  
3 which is a birth defect and absence of folic acid in  
4 a diet.

5 Folic acid I think is Vitamin B12, which is  
6 something someone doesn't have in their diet, and  
7 when they don't have it, there is a greater  
8 incidence of this birth defect, which is rather  
9 serious, a hole in the back of your spine.

10 A confounding factor is the age of the  
11 mother, because as women get older, they are in  
12 general likelier to have children with certain kinds  
13 of birth defects, and spina bifida is one of those.

14 So a study -- and there have been studies on  
15 the effect of folic acid, dietary supplements on the  
16 rate of this outcome -- has to adjust for the age of  
17 the mother. If it doesn't, the age of the mother is  
18 confounding, it's a competing risk that could be  
19 producing the outcome, you see.

20 Usually you can adjust for it just by making  
21 sure that women of the same age are in both of the  
22 groups of your study, but if you can't do that,  
23 there are also statistical formulas you can use.

24 Q. So as a practical matter, were confounding  
25 factors a problem in the EPA report?

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1 MR. FURR: Excuse me, Doctor.  
2 Objection, Your Honor. It's beyond the scope of the  
3 deposition. I can demonstrate with the deposition.

4 THE COURT: That's not my point.  
5 Overruled.

6 MR. FURR: Your Honor, may I approach?

7 THE COURT: I know what you're talking  
8 about, and I thought I expressed myself earlier.

9 Q. (By Mr. Rosenblatt) Doctor, you can answer  
10 the question.

11 A. Okay. The EPA assembled the confounding  
12 factors that -- from the papers it reviewed in a  
13 table where it indicated which of the studies had  
14 used age as a factor to correct for which of the  
15 studies had used education or income or other  
16 lifestyle-type factors to correct for and so on.

17 It also indicated what statistical technique  
18 had been used for these corrections. Based on the  
19 information in that table, and also elsewhere in the  
20 volume, I checked several things. First, that most  
21 of the studies had appropriate confounders used.

22 Appropriate in my judgment of what is likely  
23 to be relevant for studies of this sort of outcome  
24 based on earlier chapters in the book, age  
25 certainly, because lung cancer is a function of age

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1 and so forth.

2       Second, I checked that the net effect of all  
3 the adjustments was neither to increase nor to  
4 decrease the claimed relative risk of environmental  
5 tobacco smoke for lung cancer.

6       If you have set studies for all, of which  
7 the adjustment raises the relative risks, you have  
8 more reason to be skeptical than if the adjustment  
9 raises some, lowers others, leaves some the same.  
10 This is likelier to be fair.

11       I checked that most studies had something  
12 like education or income in them, because those are  
13 the best substitutes for factors of lifestyle, like  
14 access to health care, that are otherwise rather  
15 difficult to measure.

16       I studied the EPA's justification for  
17 leaving out some other factors, such as diet and  
18 history of lung disease. Based on the literature  
19 they reviewed, I was persuaded that it was  
20 reasonable to leave them out.

21       And then I thought very hard, based on my  
22 own experience as a statistician, of the ways in  
23 which -- one peculiar aspect of the study here is  
24 that so many of them are so-called dose response  
25 studies, the way that that might have something to

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1 do with the logic of covariate, and I could not  
2 think of any covariate that I have used or other  
3 people in my field has used that seemed to be  
4 indicated as appropriate to this kind of study.

5 So I think that was five things that I did  
6 about covariates.

7 Q. Now, in terms of the use of a 90 or  
8 95 percent confidence level, which one did the EPA  
9 use and did they use it correctly from a statistical  
10 methodology point of view?

11 A. Okay. There are two different answers to  
12 that question. And I apologize in advance for the  
13 fact that I'm going to have to answer it two  
14 different times. The answer will be the same in  
15 both cases, that they used it appropriately.

16 But the way they used it is two different  
17 ways. In one way of using it, they sorted the  
18 original studies by what the apparent relative risk  
19 of lung cancer was and reported those using a  
20 so-called one-tailed test, 90 percent or 95 percent  
21 confidence.

22 This is appropriate for studies in which you  
23 have a pretty good idea in advance of the direction  
24 in which the finding's going to occur.

25 The other way in which the EPA used this

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1 idea of one-tailed test was in reporting some of the  
2 findings of the meta-analysis. And here -- for  
3 instance, I just told you that the probability of  
4 getting 24 boys out of 30 babies, the probability of  
5 getting 24 positive findings out of 30, was one in a  
6 thousand. That's a one-tailed test because I said  
7 what direction positive was supposed to go.

8 If I had done that as a two-tailed test, I  
9 should have said two out of a thousand, because I  
10 might have gotten six boy babies instead of 24. I  
11 might have gotten 24 studies that showed a  
12 protective effect of ETS instead of a risk factor.  
13 I didn't.

14 In that sense, the EPA also continually used  
15 a one-tailed test. And so, for instance, when they  
16 reported a probability of one in 100,000 for a  
17 particular kind of pattern -- in this case it was 17  
18 out of 17 studies showing accessories being in the  
19 highest dose category, that's 17 straight boys --  
20 they reported one out of 100,000 as one-tailed test,  
21 and they should have reported, if they were doing a  
22 two-tailed test, two out of 100,000.

23 They would argue that they knew the  
24 direction it was going to be a risk factor, so one  
25 out of 100,000 is the correct probability.

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1           The difference between one and two out of  
2 100,000 is rather small.

3           Other such effects are one in a billion for  
4 a one-tailed test, two in a billion for a two-tailed  
5 test. So those are the two different ways in which  
6 this issue of the number of tails, one or two, the  
7 difference between 90 and 95, came into the report.

8           I find their judgment sound in all of these  
9 respects.

10          Q. Were you able to find any statistical or  
11 methodological evidence other than coming from the  
12 tobacco industry against the conclusions of the  
13 Environmental Protection Agency?

14           MR. FURR: Objection, Your Honor. This  
15 is beyond the scope of the deposition.

16           THE COURT: I'm not worried about the  
17 deposition. I don't even want to talk about the  
18 deposition at this point.

19           If you want to talk about this thing  
20 sidebar, but don't mention that word on the  
21 objection.

22           (The attorneys and the court reporter  
23 approached the bench, and the following proceedings  
24 were had outside the hearing of the jury.)

25           THE COURT: I think what the problem

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1 is, you're misunderstanding the Court's intention on  
2 this alleged "deposition."

3 Just because it wasn't asked at the  
4 deposition -- just because it didn't come up at  
5 deposition isn't any reason for keeping it out on  
6 direct.

7 If he's formulating these opinions and done  
8 these studies following the deposition and you  
9 weren't aware of it, that's a different story.

10 MR. FURR: I understand and that's what  
11 we are talking about now, I believe.

12 MS. ROSENBLATT: He was asked at his  
13 deposition about criticism of the EPA's analysis.  
14 He investigated and discussed all of the criticism

15 MR. FURR: What page is that?

16 MS. ROSENBLATT: Page 35. I looked up  
17 in the index criticisms. This whole role was the  
18 flaws. He looked up what were the attacks, what  
19 were the criticisms of it, and basically that's what  
20 he's talking about now. This was all covered in the  
21 deposition, criticisms. That's not anything --

22 THE COURT: Have you talked to him  
23 before you put him on the stand regarding the rule  
24 not to talk about anything that happened subsequent  
25 to the deposition?

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1 MS. ROSENBLATT: Absolutely. He read  
2 all the underlying studies and everything, and I  
3 told him if he's asked about it before he answers,  
4 he might even go to clear it with you. I said not  
5 to discuss anything he reviewed after the fact.

6 THE COURT: Okay. That's what I'm  
7 talking about.

8 MR. FURR: Okay.

9 (The following proceedings were had within  
10 the hearing of the jury:)

11 Q. (By Mr. Rosenblatt) Dr. Bookstein, in  
12 connection with analyzing the EPA report, the  
13 statistician and the methodologist used, did you  
14 investigate the criticisms put forth by the tobacco  
15 industry against the EPA report?

16 A. Yes, I did.

17 Q. And did you find those criticisms to have  
18 any validity?

19 A. I found them to be without merit.

20 Q. Were you able to find criticisms coming from  
21 any source -- criticisms of the methodologist and  
22 statistical analysis and the meta-analysis used in  
23 the EPA report from any source other than the  
24 tobacco industry?

25 A. Not every critical article acknowledged

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1 support of the tobacco industry, so I think I have  
2 to answer your question in the form I don't know.

3 Q. Okay. Now, the concept of -- first of all,  
4 explain to the jury, from a statistical or  
5 methodological standpoint what we mean by the  
6 concept of relative risk?

7 A. The easiest way to do that is in a setting  
8 of a study between two groups such as the one here,  
9 wives of smokers and -- wives of non-smokers and  
10 wives of smokers.

11 A relative risk in that context is the rate  
12 of developing a bad outcome in one group just  
13 divided by the rate of developing a bad outcome in  
14 another group.

15 So to take the results of one of the  
16 studies, not the most extreme -- if in the group of  
17 wives of non-smokers there were actually -- I don't  
18 remember the number, so forgive me if I make one up,  
19 there were roughly 100 lung cancers per 100,000  
20 people; and in the group of wives of heavy smokers,  
21 there were about 240 lung cancers per 100,000  
22 people, then the relative risk is 2.4. 240 divided  
23 by 100.

24 Q. In terms of the relative risk set forth in  
25 the EPA report -- and again, I'm asking you this

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1 from your position as a statistician, was the  
2 relative risk in the EPA report understated or was  
3 it overstated?

4 A. The relative risk in the EPA report was  
5 understated because it was comparing wives of  
6 smokers to wives of non-smokers without considering  
7 the other sources of exposure to ETS; and the EPA,  
8 in this report, explained that and attempted to  
9 correct its estimate of the total numbers of lung  
10 cancer attributed to -- EPA explained that and  
11 attempted to correct its estimate at the total  
12 number of lung cancer for all forms of exposure.

13 Q. Based on the numbers, based on the  
14 statistics, based on the methodologies used  
15 throughout the EPA report, including the  
16 meta-analysis and every other method used, are you  
17 satisfied, from a statistical standpoint, from the  
18 standpoint of your field of expertise, are the  
19 conclusions that have been reached by the EPA  
20 correct?

21 A. The conclusions that have been reached by  
22 the EPA are perfectly properly drawn from my  
23 professional point of view.

24 MR. ROSENBLATT: Thank you,  
25 Dr. Bookstein.

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1 THE COURT: Cross?

2 MR. FURR: Yes.

3 CROSS EXAMINATION

4 BY MR. FURR:

5 Q. Good afternoon, Dr. Bookstein.

6 A. Hello, Counsel.

7 Q. I won't introduce myself because you and I  
8 have met before; is that right?

9 A. Yes.

10 Q. Mr. Rosenblatt began your direct examination  
11 by reviewing your academic history. Do you recall  
12 that?

13 A. Yes.

14 Q. I'd like to start at the same place.

15 Now, during your teenage years, you were a  
16 prodigy in math; is that correct?

17 A. Yes.

18 THE COURT: I didn't hear the word.

19 MR. FURR: Prodigy. During his teenage  
20 years, Dr. Bookstein had a gift in math; is that  
21 correct?

22 THE WITNESS: Yes.

23 Q. (By Mr. Furr) In fact, you began attending  
24 the University of Michigan as a math major at the  
25 age of 15 without ever having graduated high school;

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1 is that correct?

2 A. Yes.

3 Q. Now, while you were at the University of  
4 Michigan, you lost your gift in math?

5 A. I lost my skill in what mathematicians need  
6 to use mathematics for which is to do new  
7 mathematics.

8 I kept most of my ability with formulas and  
9 I picked up an ability in geometry that I didn't  
10 know I have.

11 Q. I think you told Mr. Rosenblatt that you did  
12 graduate from the University of Michigan with a  
13 degree in math; is that right?

14 A. Yes.

15 Q. And I believe you mentioned you next went to  
16 Harvard University and entered the graduate program  
17 in mathematics; is that correct?

18 A. Yes.

19 Q. And you lasted four weeks there; is that  
20 right?

21 A. Yes.

22 Q. And in your own words, you crashed and  
23 burned because you know longer had the ability to  
24 make any sense out of the curriculum of graduate  
25 mathematics; is that correct?

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1 A. Yes. What I said, I think, was that I could  
2 no longer solve the problems that didn't have the  
3 answers at the back of the book.

4 Q. Thank you.

5 And after that, I think you said that you  
6 next went to the sociology department of Harvard; is  
7 that correct?

8 A. It was called social relations. When I went  
9 there, it changed its name to sociology.

10 Q. We call it sociology today?

11 A. Yes.

12 Q. Now, you told the jury that rather than  
13 complete your doctorate in sociology, instead you  
14 transferred to Michigan. Do you recall that?

15 A. There was a step in between where I worked  
16 for two years as a senior data analyst at the  
17 Harvard School of Public Health; but the leaving  
18 sociology was not voluntary on my part.

19 Q. In fact, you didn't have the option to  
20 finish your degree in sociology, did you?

21 A. I did not have the option to finish my  
22 degree by submitting the dissertation that I wished  
23 to submit, which was about a new statistical method.  
24 My committee resigned me altogether one day.

25 Q. So, in fact, you were asked to drop out of

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1 the Department of Sociology because of a failure to  
2 progress toward your Ph.D.?

3 A. When I decided not to alter the description  
4 of the dissertation, yes, that is true.

5 Q. You ultimately did get a Ph.D. from the  
6 University of Michigan in statistics of zoology; is  
7 that correct?

8 A. Yes.

9 Q. And you did that without ever taking a class  
10 in either statistics or zoology; is that correct?

11 A. Yes, that's where the two years of work as a  
12 senior data analyst came in. I was --

13 Q. Go ahead.

14 A. I was able to convince my faculty at  
15 Michigan that what I had picked up in experience  
16 over those two years was as important as anything  
17 that they might be able to teach me that was in the  
18 actual curriculum; and as I said, I passed the  
19 examinations that corresponded to people who have  
20 taken all the required courses.

21 Q. Your current position, this distinguished  
22 research scientist position at Michigan --

23 A. Yes.

24 Q. That's a non-tenured position and it's not  
25 in an academic department; is that correct?

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1 A. Yes.

2 Q. I think you also told us that you made up  
3 this word, morphometrics, to describe a statistical  
4 discipline; is that right?

5 A. I believe I coined the word morphometrics to  
6 describe what it was that I was doing when I was  
7 working on my dissertation and what it is that I  
8 still do.

9 It turns out that it has become a discipline  
10 of statistics in the sense now in the last few years  
11 there are courses in this and there are books about  
12 this, textbooks about this that use my work; so I  
13 didn't set out to make it a discipline -- a  
14 sub-discipline, but it seems to have become one.

15 Q. And, in fact, the mathematics that are  
16 employed in morphometrics has advanced to a level  
17 you can't master them any longer?

18 A. Some of the mathematics underlying it are  
19 the course of mathematics I was not able to do in  
20 graduate school. The harder parts of probability  
21 theory, for instance, and I cannot review those  
22 parts of papers in my own field.

23 Q. Let's switch gears and talk about your  
24 expertise on other issues related to this case.

25 You have never conducted any original

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1 epidemiological research on environmental tobacco  
2 smoke or lung cancer or flight attendants, have you?

3 A. That's correct.

4 Q. And you haven't published any articles on  
5 topics dealing with lung cancer, environmental  
6 tobacco smoke or flight attendants, have you?

7 A. That's correct.

8 Q. And the curriculum vitae that you were asked  
9 some questions about from Mr. Rosenblatt, at least  
10 the copy that I have is about 19 pages long. Does  
11 that sound correct?

12 A. Yes.

13 Q. And in those 19 pages, there is not a single  
14 reference to any activity involving environmental  
15 tobacco smoke, lung cancer or flight attendants, is  
16 there?

17 A. That's correct.

18 Q. Now, with respect to these opinions that you  
19 have provided to the jury today related to  
20 environmental tobacco smoke, you formed these  
21 opinions even though you had no professional  
22 knowledge at all about environmental tobacco smoke;  
23 is that right?

24 A. These are opinions about the reasoning in  
25 this book.

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1 Q. That's what I want to make clear. You're  
2 not claiming to have any expertise whatsoever about  
3 environmental tobacco smoke, are you?

4 A. Not about environmental tobacco smoke  
5 specifically, but I have expertise in statistical  
6 issues that are related to the statistical study of  
7 environmental tobacco smoke that has been the claim  
8 all along.

9 Q. Your testimony today is about the  
10 statistical reasoning contained in the report rather  
11 than the subject matter of the report; is that  
12 correct?

13 A. Yes.

14 Q. For instance, you don't have any expertise  
15 in lung cancer, do you?

16 A. Correct.

17 Q. And you don't have any expertise in issues  
18 related to flight attendants such as the working  
19 conditions of flight attendants; is that correct?

20 MR. ROSENBLATT: Objection, Your Honor,  
21 repetition.

22 THE COURT: Overruled.

23 THE WITNESS: Yes, that's correct.

24 Q. (By Mr. Furr) You did express some opinions  
25 today about the Environmental Protection Agency's

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1 statistical reasoning process, correct?

2 A. Not the process. Essentially I expressed  
3 opinions about the outcome of that process which is  
4 the -- reasonable in this volume.

5 Q. Okay. Now, these opinions that you  
6 expressed to the jury today, you formed these  
7 opinions without ever reading the underlying  
8 epidemiological studies, the underlying toxicology  
9 studies or any of the underlying chemistry and  
10 exposure studies; is that correct?

11 A. That's correct.

12 What the EPA suggested that the reader of  
13 this report should know about those studies is  
14 summarized in several of its early chapters, and, of  
15 course, the statistics from the original studies are  
16 presented in many extensive tables in the chapter  
17 that I hand out to my students.

18 Q. And when you initially formed your opinions,  
19 you did so without ever going beyond the EPA record  
20 in determining whether or not the EPA had accurately  
21 described and analyzed the underlying studies?

22 A. Yes, although I strongly suspect if there  
23 were any inaccuracies there we would have heard  
24 about them by now.

25 This report has received a tremendous amount  
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1 of very detailed scrutiny. I relied upon the  
2 quality of that scrutiny for the accuracy of the  
3 transcriptions.

4 Q. And, in fact, you didn't bother reading the  
5 underlying studies when you initially formed your  
6 opinion because you determined that you could not  
7 foresee any way in which reviewing those studies  
8 would alter your judgment; is that correct?

9 A. Not entirely. Reviewing new studies,  
10 studies that the EPA had not used could alter my  
11 judgment, and reviewing the EPA's criteria for  
12 assigning quality could have altered my judgment if  
13 it had turned out to be different from the way they  
14 did.

15 Q. Okay. But that's not something that you did  
16 before you initially formed your opinions; is that  
17 correct?

18 A. That's correct.

19 Q. Mr. Rosenblatt talked to you about the topic  
20 of confounding or -- did you also use the  
21 terminology of covariate when you were discussing  
22 this?

23 A. Yes.

24 Q. Can you tell us how those terms relate?

25 A. They mean the same thing but essentially a

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1 covariate is something you already thought of, and a  
2 confounder is something that a critic has brought to  
3 your attention.

4         So in that study of spina bifida that -- and  
5 folic acid and maternal age that I was telling you  
6 about, if the study didn't originally set out to use  
7 maternal age but had to be reminded of it, it would  
8 have been a potential confounder.

9         If the study was of the rate of spina bifida  
10 as a function of vitamin B12 intake and maternal  
11 age, then it would have been a covariate. The data  
12 are the same. The words represent different  
13 scientific strategies, essentially.

14         Q. But the consequence of either a covariate or  
15 a confounder is the same; is that correct?

16         A. What one does with a covariate and what one  
17 does with a confounder, once one has a value for it,  
18 is to adjust other statistics in the study to take  
19 into account these additional risk factors or to put  
20 upper limits on the amount of adjustment you might  
21 need; so you have a choice of either going out and  
22 getting the covariate and doing the analysis or  
23 estimating, from a reasonable set of literature,  
24 what would happen if you did that.

25         Q. Let's talk about what we mean by confounding

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1 in the context of a spousal smoking lung cancer  
2 study.

3 A. Mm-hmm.

4 Q. For a factor to be a confounder in one of  
5 these epidemiological studies that we are  
6 discussing, it would have to be correlated both with  
7 the outcome, which in this case is lung cancer, and  
8 with the exposure variable, which in this case is  
9 spousal smoking status; is that correct?

10 A. That is correct in part. Remember, however,  
11 that these studies already have some competing risks  
12 entered in.

13 There are some covariates in these studies,  
14 so a confounder now needs also to be substantially  
15 uncorrelated with the other covariates and  
16 confounders that have already been adjusted for and  
17 that's an important criteria.

18 Q. You told us EPA did, in fact, look at  
19 confounding in considering the epidemiological  
20 studies, correct?

21 A. They reviewed the adjustments for covariates  
22 of the original studies and also considered some of  
23 their own, yes.

24 Q. And one of EPA's conclusions was that it  
25 would be unlikely for a factor to be a confounder

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1 across studies from different cultures; is that  
2 correct?

3 A. For confounders that cannot yet be entered  
4 into the tables like age or I think education, and  
5 for confounders that they did not discuss in their  
6 own tables which included diet, history of lung  
7 disease and three others that I've forgotten, yes,  
8 that was their conclusion; but it was not as general  
9 as you've just stated it.

10 Q. Okay. You're aware that the EPA report was  
11 reviewed twice by the EPA Science Advisory Board  
12 panel, aren't you?

13 A. I did not know it was twice.

14 Q. You know it was reviewed by a scientific  
15 advisory board panel?

16 A. Yes.

17 Q. Are you also -- you're also aware, I assume,  
18 then, that Dr. Jeffrey Cabot is a member of the SAB  
19 panel that reviewed the EPA report?

20 A. I saw his name in this volume, yes.

21 Q. You're aware he is an epidemiologist?

22 A. I did not know that but I'm not surprised.

23 Q. He's listed as an epidemiologist in the  
24 book, isn't he?

25 A. (Witness nods.)

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1 Q. You're also aware, I take it, he is the  
2 first author or lead investigator of one of the  
3 epidemiological studies that underlie the report?

4 A. Yes, as well as one that has appeared since  
5 the report was printed.

6 Q. Are you aware that this month Dr. Cabot  
7 reported that he had conducted a study of  
8 confounding --

9 THE COURT: Just a moment.

10 MR. ROSENBLATT: Objection, Your Honor,  
11 this is now going past the depo.

12 THE COURT: Sustained.

13 MR. FURR: Your Honor, may I approach.

14 THE COURT: If you want to talk about  
15 it, I guess we can talk about it.

16 (The attorneys and the court reporter  
17 approached the bench, and the following proceedings  
18 were had outside the hearing of the jury.)

19 MR. FURR: Your Honor, his objection --  
20 I guess I should let him go.

21 MR. ROSENBLATT: Your ruling was as  
22 clear as a bell, I thought, on this.

23 THE COURT: Nothing that took place  
24 after the deposition.

25 MS. ROSENBLATT: He did a lot since the  
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1 depo.

2 THE COURT: I understand that. I just  
3 don't know --

4 MR. FURR: Your Honor, maybe this  
5 limited to the depo thing has taken a life of its  
6 own.

7 You ruled he cannot testify about work that  
8 he had performed after the deposition. I don't  
9 understand how that could in any way prohibit me  
10 from cross examining him on material that fits under  
11 rule 706, I believe it is.

12 THE COURT: The reason is they wouldn't  
13 have had a chance to cross examine.

14 MR. FURR: I'm opening the door on it  
15 now.

16 THE COURT: That doesn't help any. No.  
17 I'll sustain the objection.

18 MR. MOSS: Before we run away, unless  
19 you don't want to hear it. Then we need to be given  
20 an opportunity to make a proffer with this witness  
21 because we obviously -- we feel rather strongly that  
22 your position's correct. But we understand your  
23 ruling about before we just --

24 MR. FURR: Your Honor, may I explain.

25 THE COURT: There is a major rule that  
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1 everybody at trial goes by, and that's no trial by  
2 ambush; and whether that's a rule or this rule or  
3 that rule, intrinsic fair play is what I go by. And  
4 if they didn't have an opportunity to get into this  
5 point either on deposition or otherwise, then this  
6 is taking by surprise.

7 I don't think it's appropriate.

8 MR. ROSS: You don't have to impeach a  
9 witness at his deposition.

10 MR. FURR: Your Honor, there have been  
11 a series of witnesses that have testified, including  
12 Dr. Burns most recently, in which Mr. Rosenblatt  
13 asked Dr. Burns was it -- was the EPA'S conclusion  
14 unanimously agreed upon and confirmed by the entire  
15 scientific advisory.

16 THE COURT: That's totally different.  
17 Totally different. Sorry about that. I'm just not  
18 going to do it.

19 MR. WHITING: Can we make a proffer?

20 THE COURT: What?

21 MR. WHITING: I said, may we be  
22 permitted to make a proffer.

23 THE COURT: Yes, when it's finished.

24 (The following proceedings were had within  
25 the hearing of the jury:)

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1 Q. (By Mr. Furr) Dr. Bookstein, there is a  
2 difference between finding a statistical association  
3 between environmental tobacco smoke and lung cancer  
4 and in demonstrating that environmental tobacco  
5 smoke exposure, in fact, causes lung cancer; isn't  
6 there?

7 A. I'm sure there is, yes.

8 Q. And you would agree that a claim of  
9 causation is based upon a great many factors  
10 including a majority of things that are not  
11 statistical; is that correct?

12 MR. ROSENBLATT: Objection, Your Honor,  
13 beyond the scope. I didn't get into causation.

14 MR. FURR: Of course you did. You  
15 asked him whether the EPA report --

16 THE COURT: So as far as that question  
17 is concerned, overruled. I don't know where you get  
18 involved with it, but it's thin.

19 THE WITNESS: Could you repeat the  
20 question?

21 Q. (By Mr. Furr) You would agree that a claim  
22 of causation is based upon a great many factors, a  
23 majority of which are not statistical in nature,  
24 wouldn't you?

25 A. Yes. As I remember, the EPA listed five

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1 criteria, that was the knowledge that active smoking  
2 causes cancer, high dose effect. There was the  
3 biological plausibility argument that mainstream  
4 smoke and sidestream smoke are similar. There was  
5 the argument that environmental tobacco smoke can be  
6 detected in the bodies of people exposed to it.  
7 There was the argument from experiments with  
8 laboratory animals, and there was the epidemiology,  
9 so yes, there were five, and statistics is most  
10 important in the fifth.

11 Q. In fact, as a statistician, you have  
12 referred to the issue of whether ETS exposure causes  
13 lung cancer as a scotch verdict or something not  
14 proven, haven't you?

15 A. I'm laughing because that was an extremely  
16 confused moment in my deposition.

17 What I think I said was that the -- as a  
18 statistician, you should be careful, but the  
19 statistician as the member of a research team can  
20 certainly take a stand about these issues of  
21 causation as I have in my own work from time to  
22 time.

23 MR. FURR: That's all I have. Thank  
24 you.

25 THE COURT: Any redirect?

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1 MR. ROSENBLATT: Yes, Your Honor.

2 REDIRECT EXAMINATION

3 BY MR. ROSENBLATT:

4 Q. Tell us about this prodigy thing.

5 You were a prodigy at 15 and you went to the  
6 University of Michigan before you graduated high  
7 school and then somehow you lost it?

8 A. This is -- yes. This is not rare among  
9 mathematicians, although I wish someone had told me  
10 when I was younger.

11 Mathematics is a little like chess, an  
12 ability that it peeks very young.

13 At the age of 13, I was -- at the age of 14,  
14 I won the Michigan mathematics prize competition for  
15 high school students of all ages, but my skills  
16 turned out to be the very specialized ones of  
17 answering questions like the questions on the  
18 examinations or the questions in the textbooks.

19 And I went -- I stayed in my math courses  
20 about two years past the time when someone should  
21 have told me that.

22 So by the time I got to grad school in math  
23 and could not solve the problems anymore because  
24 they didn't have answers in the back of the book, it  
25 was more than embarrassing.

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1 Q. But in terms of your Ph.D. in statistics,  
2 and compared to just regular everyday kind of  
3 mathematicians who are not prodigies, do you deal  
4 with higher mathematics in your work?

5 A. I use some higher mathematics in my work  
6 which I have taken a great deal of pains to  
7 translate into geometry. It turns out I'm rather  
8 good at visualizing things as I use my hands rather  
9 good with blackboards, rather good with diagrams.

10 My statistics book has more figures in it  
11 than any other book in history, and when I can  
12 understand things as geometry as things out there in  
13 space, I can keep them with me.

14 Q. You're obviously not an expert on lung  
15 cancer?

16 A. Yes.

17 Q. You're not an expert on secondhand smoke?

18 A. Yes.

19 Q. But you're an expert on statistics and  
20 meta-analysis and the methodologies used in the EPA  
21 report; is that correct?

22 A. Yes.

23 Q. Is it fair to say, Dr. Bookstein, that  
24 before you ever heard of this lawsuit, before you  
25 ever had any involvement in this lawsuit, you

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1 thought so highly of the EPA report that you decided  
2 to use it in your course and have used it from that  
3 time until this time?

4 MR. MOSS: Your Honor, this is  
5 repetitive.

6 THE COURT: Sustained.

7 MR. ROSENBLATT: I didn't hear your  
8 bottomline, Judge.

9 THE COURT: Sustained.

10 MR. ROSENBLATT: Maybe I didn't want to  
11 hear it.

12 The question that Susan just suggested  
13 to me is also repetitious so I'm going to quit.

14 THE COURT: Thank you, Dr. Bookstein.  
15 You can step down. Let's take a break.

16 (The jury retired from the courtroom and the  
17 following proceedings were had:)

18 THE COURT: Do you want to come back  
19 and have a seat? There are a couple questions we  
20 have to talk about outside the presence of the jury.  
21 Go ahead.

22 MS. ROSENBLATT: Your Honor, in  
23 responding to these, can the witness refer to  
24 matters he's considered since his deposition? I  
25 mean, I think it has to do --

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1 THE COURT: This is a proffer. This is  
2 not a Voir dire in that sense, it's a proffer. And  
3 I want to know what the proffer is, so you tell me  
4 what you want to put on the record and then I'll  
5 decide whether or not we are going to get to Q and  
6 A.

7 MR. FURR: What I'd like to put on the  
8 record --

9 MR. MOSS: If we are going to do that,  
10 we need to put it outside the presence of the  
11 witness, Your Honor.

12 THE COURT: If you'll step outside, I  
13 appreciate it, sir.

14 (The following proceedings were had outside  
15 the presence of the witness:)

16 MR. FURR: Your Honor, what I intended  
17 to put on the record was to tell on -- straight  
18 through this witness that Dr. Jeffrey Cabot, who was  
19 a member of the Scientific Advisory Board that  
20 reviewed the Environmental Protection Agency along  
21 with Dr. Linda Cue (Phonetic), whom is also an  
22 epidemiologist and who is listed as a contributor to  
23 the Environmental Protection Agency's report, has  
24 recently conducted a study in which they have found  
25 evidence of confounding which they describe as being

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1 at variance with the EPA's conclusions about  
2 confounding.

3 THE COURT: Okay. My ruling stands.  
4 You want to do that, bring them in, let them talk  
5 more about it; but otherwise, I don't think it's  
6 appropriate to take this witness after the  
7 deposition and give him information that occurred a  
8 week or so ago and then get into an area that's  
9 brand new.

10 MR. FURR: Your Honor, what I'm  
11 attempting to do is cross examining --

12 THE COURT: Folks, I made a ruling.

13 MR. MOSS: I understand but may I  
14 just --

15 THE COURT: No. Enough is enough.

16 MR. MOSS: I think it will help.

17 THE COURT: I don't think it will help  
18 at all. You've made your record.

19 MR. MOSS: Well, we haven't yet, Your  
20 Honor.

21 (The Judge exited the courtroom and the  
22 following proceedings were had:)

23 MR. MOSS: For the record, the judge  
24 has left the room. The point I was going to make  
25 was that --

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1 MR. ROSENBLATT: I don't really think  
2 this is appropriate.

3 MS. ROSENBLATT: Let's wait until the  
4 judge returns. We'd rather not --

5 MR. MOSS: I'm going to say what I want  
6 to say on the record. You-all can read it to the  
7 judge if you like.

8 This is cross examination and there is no  
9 obligation at a deposition or any other time, prior  
10 to the witness testifying, to advise which cross  
11 examination and possibly impeach at trial.

12 Maybe that's what I would have said to the  
13 judge had he been here.

14 MR. FURR: What I was attempting to say  
15 when the judge left was that I was attempting to  
16 cross-examine this witness under section 9.706,  
17 authoritativeness of literature for use in cross  
18 examination.

19 (A recess was taken.)

20 THE COURT: Okay. There is a witness  
21 available?

22 MR. ROSENBLATT: Yes, Judge.

23 THE COURT: Is the jury ready?  
24 Everybody ready?

25 THE BAILIFF: Jurors entering the  
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1 courtroom.

2 (The jury entered the courtroom and the  
3 following proceedings were had:)

4 THE COURT: Okay. What's next?

5 MR. ROSENBLATT: Mr. Fulton.

6 THE COURT: Mr. Fulton, come up here  
7 please, sir.

8 HUGH B. FULTON, JR.,  
9 having been first duly sworn, was examined and  
10 testified as follows:

11 THE CLERK: Be seated, please.

12 THE COURT: All right.

13 DIRECT EXAMINATION

14 BY MR. ROSENBLATT:

15 Q. Mr. Fulton, please tell the jury your full  
16 name and where you live.

17 A. Hugh B. Fulton, Junior. I live in  
18 [DELETED].

19 Q. You are not an M.D. and you are not a Ph.D.?

20 A. That is correct.

21 Q. But you are an airline pilot?

22 A. That is correct.

23 Q. Where are you from originally?

24 A. Born in Knoxville, Tennessee. But until my  
25 dad joined Eastern Airlines, when I was about --

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1 right after I was born, then we moved here to Miami  
2 and I grew up in Miami.

3 Q. I want to go through your career as an  
4 airline pilot. And as I understand it, you  
5 basically worked for two airlines in your career,  
6 Eastern and United?

7 A. Correct.

8 Q. So, when did you first go to work for  
9 Eastern?

10 A. October of 1965.

11 Q. And how long did you work for Eastern?

12 A. Just shy of 25 years.

13 Q. And tell us about the types of planes you  
14 flew and in what capacity you flew them?

15 A. My first aircraft I was assigned to was a  
16 Lockheed L-188 known in the trade as the Electra, a  
17 four-engine turboprop plane, and I was a second  
18 officer or a flight engineer, as it was commonly  
19 known.

20 The second aircraft was the Boeing 727. My  
21 first seat on that airplane was, again, as a flight  
22 engineer or second officer. I later flew it as a  
23 co-pilot or first officer for some 10,000 hours.

24 The next airplane was the Douglas DC-9 which  
25 I flew as captain for just over nine years.

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1           And the last aircraft at Eastern, I was in  
2 school flying the Boeing 757 as captain and the  
3 strike interrupted my training, and that was my  
4 career at Eastern.

5           With United --

6       Q.   Before you get to United, let me ask you a  
7 few questions so I'll keep the two separate. Your  
8 employment with Eastern which is, obviously, much  
9 longer, and then you went to work for United.

10          When we use the term cockpit in an airplane,  
11 what are we talking about?

12       A.   Well, it's the most forward compartment in  
13 the aircraft. It contains all the flight  
14 instrumentation, systems instrumentation and  
15 switches and used to be, in the old days,  
16 three-crew-members. Now they don't make anymore  
17 three-crew-members; they are all two-crew-members,  
18 and it's separated from the cabin by a door which  
19 often has, I guess you would call it, a  
20 pressurization relief panel, and the ability to  
21 break the door down in case you have to get out in  
22 an emergency.

23       Q.   Now, the various aircraft which you flew for  
24 Eastern, how many passengers were those various  
25 planes?

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1       A.    The Electra was the smallest, and I believe  
2   it carried 90 or 98.  This goes back a lot of years.  
3   And the largest one that I actually flew at Eastern  
4   was the stretch model 727, which, I think, was about  
5   147 people.

6       Q.    Now, you know, in terms of the chain of  
7   command in the cockpit, as you were going over your  
8   history with Eastern, you had been a flight engineer  
9   and second officer, a co-pilot, and then you became  
10  a captain.  Obviously, the captain is the highest?

11      A.    That is correct.

12      Q.    So, when you fly, for example, now with  
13  United, in addition to the captain, who else is in  
14  the cockpit ordinarily?

15      A.    Just the co-pilot and the first officer.

16      Q.    We know there came a time when Eastern went  
17  out of business.  What year was that?

18      A.    The closing of the doors was January of  
19  1990.

20      Q.    So, how long of a gap was there between the  
21  time Eastern went under and you went to work for  
22  United?

23      A.    I joined United in May of '90.  So, the  
24  strike occurred in March of '89, and so I was out of  
25  work from March of '89 until May of '90.

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1 Q. And what type of aircraft have you flown  
2 since going to work for United?

3 A. I started initially on the Douglas DC-8,  
4 second officer, four-engine jet aircraft. And then  
5 the Boeing 737 300/500, which was two different  
6 models basically of the same two-engine turbo jet,  
7 two-pilot aircraft. And I'm presently flying the  
8 Boeing 757 and 767 as first officer.

9 Q. Now, I'm not asking you this question in a  
10 super-technical way, but from your standpoint as a  
11 pilot and all your experience on various aircraft,  
12 tell the jury in a general way how the ventilation  
13 in the cockpit differs, if it does, from the  
14 ventilation system that the passengers and flight  
15 attendants have?

16 A. It does differ slightly. You have to first  
17 understand the basic principle of a ventilation  
18 system in an airplane is you have a closed aluminum  
19 tube. Once you close the door, there's only one  
20 hole or exit for the air to leave the airplane.  
21 It's called an outflow valve, and it's generally at  
22 the back of the airplane.

23 So, the ventilation air comes in in front  
24 the engines. A term we use is to bleed it off the  
25 engines from under the compressor section, into the

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1 air conditioning equipment and into the fuselage  
2 where the people are and then exits out of that  
3 outflow valve at the back of the airplane.

4 Now, the primary difference between the two  
5 compartments, the cockpit and the cabin, is that at  
6 some point in the regulation process it was deemed  
7 that the pilot should have more air, a greater  
8 turnover of air in case we were to have a fire in  
9 the cockpit.

10 We have got a lot of electrical equipment  
11 out there. The circuit breaker panels are above and  
12 behind us. All the electricity in the plane is  
13 concentrated there. So, if we ever had an  
14 electrical fire, it's necessary we have maximum  
15 ventilation in the cockpit. So, we get a little bit  
16 more air. I don't know the exact numbers, but  
17 probably in the vicinity of 30 to 40 percent more  
18 ventilation in the cockpit than in the cabin.  
19 Otherwise, it's pretty much the same.

20 Q. By the way, are you a smoker or nonsmoker?

21 A. Nonsmoker.

22 Q. Ever smoked?

23 A. No, sir.

24 Q. Now, at some point in your career with  
25 Eastern Airlines, you had occasion to take some

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1 photographs, correct?

2 A. That's right.

3 Q. Now, what did you photograph -- first of  
4 all, when did you take those photographs?

5 A. It was in the early eighties, 1984.

6 MR. FURR: Excuse me. Your Honor, this  
7 may be where we need to voir dire the witness.

8 THE COURT: Okay. That's fine. Let's  
9 have a sidebar.

10 MR. ROSENBLATT: Do you want me to  
11 bring these up?

12 THE COURT: Yes, please.

13 (Counsel and the court reporter approached  
14 the bench, and the following discussion was held  
15 outside the hearing of the jury:)

16 THE COURT: Is it just the one?

17 MR. ROSENBLATT: There are six.

18 THE COURT: Let me just see what they  
19 are. Just take the top one off.

20 This purports to be what?

21 MR. ROSENBLATT: Basically photographs  
22 relating to the outflow valves.

23 THE COURT: Okay. That's where it is  
24 on that plane. Okay. I see it.

25 Okay. All right. I get the idea. Okay.

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1                   MR. FURR: Here's what we want to  
2 establish, Your Honor. The witness told us in the  
3 deposition that he never sampled the material, never  
4 tested it, he doesn't really know what it is.

5                   He's assumed it's tobacco smoke, but even if  
6 it's related in part to tobacco smoke, he certainly  
7 doesn't know that the whole stain is related to  
8 tobacco smoke. It may be a mixture of tobacco smoke  
9 and something else.

10                  He's also told us in his deposition that he  
11 cannot relate the occurrence of that stain to any  
12 particular concentration of environmental tobacco  
13 smoke within the airliner cabin or any health  
14 effects of the flight attendants.

15                  So, really, all the photographs can be used  
16 to illustrate that, at one point in time, there was  
17 smoking in the cabin which is not disputed and that,  
18 when the smoking was exhausted, it may have  
19 contributed to staining the side of the plane.

20                  It's not probative of any concentration of  
21 environmental tobacco smoke in the cabin or the  
22 health effects of the flight attendants. It's  
23 prejudicial in that it suggests the jury may draw  
24 inference from this that it is related to a certain  
25 level of exposure.

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1           And moreover, after Mr. Williams' testimony  
2 yesterday, it's now cumulative because Mr. Williams  
3 testified twice yesterday that outflow valves get  
4 stained by what he thought may be tobacco present.

5           MR. COFER: I think in addition, in the  
6 deposition, Mr. Fulton did not testify how many  
7 flights the plane had flown before it had that built  
8 up, so we have no idea how much smoke, how many  
9 flights and when this was cleaned, so clearly no  
10 inference can be drawn as to the amount of tobacco.

11          THE COURT: I'm not sure we are getting  
12 into inferences on the amounts or the quality of it.

13          MR. MOSS: Nor the length of time.

14          THE COURT: Well, the only thing that  
15 this shows, in my opinion, and what it could be used  
16 for is to show the outflow valve, where it is on the  
17 plane, how big it is and that sort of thing, and  
18 that's there's staining as a result of it. Unless  
19 he has taken some scientific studies to show what  
20 the stain is --

21          MR. ROSENBLATT: He knows it's tobacco.

22          THE COURT: How does he know?

23          MR. ROSENBLATT: Because it couldn't be  
24 anything else.

25          THE COURT: I can't buy that.

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1 MR. FURR: He said on deposition he  
2 doesn't know it's tobacco.

3 THE COURT: I'm not going to buy that  
4 because he doesn't have any expertise.

5 MR. ROSENBLATT: He smelled it.

6 THE COURT: He could say it smelled  
7 like tobacco.

8 MR. ROSENBLATT: I understand. Without  
9 question he didn't take it to a lab. But see, he  
10 had a reason and, obviously, it had nothing to do  
11 with this lawsuit. He had a personal reason for  
12 taking these photographs, because smoke bothered  
13 him.

14 THE COURT: Okay.

15 MR. ROSENBLATT: So, that's why he took  
16 them.

17 THE COURT: He can testify that he took  
18 the pictures, that's the valve, that that's the  
19 stain, he smelled the stain and it smells like  
20 tobacco.

21 MR. MOSS: But he can't testify for his  
22 reason that tobacco bothered him.

23 THE COURT: I don't know why not.

24 MR. MOSS: Because it's not relevant to  
25 this case, Your Honor. It's not relevant to this

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1 case.

2 THE COURT: Why not? I mean, the man  
3 says, Why I took the pictures is because I smelled  
4 tobacco smoke and I wanted to know what happened to  
5 it. Now I see it went to the outflow valve.

6 MR. MOSS: No, no, no. I'm sorry I  
7 didn't make my point. Stan wants him to testify,  
8 "Why did you take the pictures?"

9 "I took the pictures because tobacco smoke  
10 bothers me," and that's the point I object to. The  
11 reason for his taking the pictures, the tobacco  
12 smoke bothering him, is totally irrelevant to any  
13 issue that we're deciding in this case because the  
14 trial plan --

15 MR. ROSENBLATT: That doesn't make it  
16 inadmissible.

17 THE COURT: I agree, it doesn't make it  
18 inadmissible. Overrule that objection, but I'm not  
19 going to get any deeper in the quality of the  
20 analysis.

21 MR. ROSENBLATT: No.

22 THE COURT: No, he doesn't know.

23 MR. FURR: I didn't understand that.

24 THE COURT: He can testify that he  
25 doesn't like the tobacco smoke, he wanted to know

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1 what happened to the smoke, where does it go, he  
2 goes out to the outflow valve and took pictures and  
3 sees the stains, smells the stains, smells like  
4 tobacco; that's all he can testify to.

5 MR. ROSENBLATT: But obviously, I'm  
6 going to offer the photographs.

7 THE COURT: Yes, okay.

8 MR. MOSS: I just want the record to  
9 reflect that we object. We don't have to object  
10 while the jury is here.

11 THE COURT: The objection is on the  
12 record.

13 MR. MOSS: That's all I wanted.

14 (The following proceedings were held within  
15 the hearing of the jury:)

16 MR. ROSENBLATT: Plaintiffs' Composite  
17 Exhibit 889 consisting, I believe, of six  
18 photographs.

19 THE CLERK: Plaintiffs' Exhibit 889  
20 into evidence?

21 MR. ROSENBLATT: Yes. The judge ruled.

22 BY MR. ROSENBLATT:

23 Q. Mr. Fulton, when did you take these  
24 photographs? The date appears -- did you put that  
25 there?

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1       A.    I did.  It says February, 1984.

2               THE COURT:  '84 you said?

3               THE WITNESS:  That is correct.

4  BY MR. ROSENBLATT:

5       Q.    Why don't you explain to the jury what part  
6  of the aircraft -- you can come down.  Am I holding  
7  it the right way?

8       A.    That's the right way.  This is the underside  
9  of the tail section of a 727.  That's the aft air  
10 stairs you see there.  This is a tail skid to  
11 protect the center engine from a tail strike if the  
12 airplane rotates.  This is the outflow valve.

13            As I mentioned earlier, it's a pressurized  
14 aluminum tube, and the air comes in basically at the  
15 front of the airplane and goes out at the back of  
16 the airplane.  That's the only exit for the air  
17 that's pumped into the aircraft for both ventilation  
18 and pressurization.

19            This little door you see on the leading edge  
20 of this closes.  It's in the ground position now.  
21 It's wide open because you want the airplane  
22 completely depressurized on the ground so that you  
23 can open the doors.

24            In flight, there's so much pressure inside  
25 the airplane, you can't open a door.  There's too

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1 much pressure against it. As you climb up after  
2 take-off, you need to keep the cabin down close to  
3 the ground so your passengers can breathe normally.  
4 So, this door closes a little bit by little bit,  
5 very smoothly and slowly, until it's almost  
6 completely closed when you are at high altitude, and  
7 that generates sufficient pressure inside the  
8 airplane so that you feel like you are still on the  
9 ground and you can breathe normally.

10 Q. If this is just a close-up or something, you  
11 don't have to go through the whole explanation  
12 again.

13 A. Yes. That should be. Let's double-check,  
14 because these things look similar and alike. Yes,  
15 727, same valve, just a close-up of that valve  
16 showing the hinge mechanism where the little door  
17 sort of slides and rotates across to close the  
18 opening.

19 Q. Just a different angle?

20 A. It's upside-down. Different aircraft.

21 Q. That's why I'm not a pilot.

22 A. This is the DC-9. See the left engine?  
23 This is the main outflow valve. Now you will notice  
24 this hole. Douglas handled the pressurization on  
25 the ground a little differently than Boeing did to

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1 assure that the aircraft is never pressurized while  
2 it's on the ground.

3 This little door pops open soon as the  
4 airplane lands. Soon as it takes off, it closes.  
5 This is the outflow valve that the air is escaping  
6 from the airplane during flight. The reason I point  
7 this out is there's a major difference in these two,  
8 and that is this brown stain that you see behind  
9 this main outflow valve that you do not see behind  
10 this valve.

11 That's because this valve is only open on  
12 the ground when smoking was not permitted in the  
13 airplane. So, there's never a smoke trail behind  
14 this valve.

15 This valve is opened while the airplane is  
16 in flight, so that brown stain you see there is  
17 tar --

18 MR. MOSS: Your Honor --

19 THE COURT: Sustain the objection. The  
20 brown stain period.

21 MR. MOSS: I thought you were just  
22 going to explain what the pictures show, the parts  
23 of the airplane, because we do need a question and  
24 answer --

25 THE COURT: I understand, counsel.

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1 Please.

2 BY MR. ROSENBLATT:

3 Q. What is the brown stain?

4 A. It's tobacco tar.

5 Q. How do you know that?

6 A. Because it can't be anything else. There's  
7 never anything introduced into the air of the  
8 cabin --

9 MR. MOSS: Objection, Your Honor. This  
10 is exactly what we went over, and you set ground  
11 rules.

12 THE COURT: I sustain the objection.  
13 The jury will disregard it.

14 BY MR. ROSENBLATT:

15 Q. When you took these photographs or at any  
16 other time, did you ever smell the area of the  
17 outflow valves?

18 A. Well, any time you were close to it, you  
19 could smell it.

20 Q. And what did it smell like?

21 A. Stale tobacco smoke kind of a smell.

22 Q. Why don't you have a seat?

23 Okay. You took all those pictures in  
24 February 1984. You were a pilot employed by  
25 Eastern, correct?

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1 A. That is correct.

2 Q. Why did you take them?

3 A. Well, during my years as a co-pilot, I  
4 suffered --

5 MR. FURR: Objection, Your Honor.

6 MR. MOSS: Objection. May we approach  
7 the bench?

8 THE COURT: Yes. I guess we ought to  
9 talk about it.

10 (Counsel and the court reporter approached  
11 the bench, and the following discussion was held  
12 outside the hearing of the jury:)

13 MR. MOSS: You have ruled -- not here  
14 at sidebar but before -- that there can't be any  
15 testimony by the individual plaintiffs of his or her  
16 condition and because it's a generic -- we're now a  
17 generic disease trial.

18 He's now about to talk about his problems  
19 with smoke which have nothing based upon the trial  
20 plan having -- just because he's a witness, we can't  
21 violate that rule. I mean, I thought what we did  
22 here is, "Why did you take the picture," and I  
23 thought Stanley would have talked, "Because I didn't  
24 like smoke," period.

25 MR. FURR: In addition, he's about to

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1 testify that the smoke in the cockpit from his  
2 co-workers bothered him. He's already testified  
3 that the cockpit and the airline cabin where the  
4 flight attendants work are on separate ventilation  
5 symptoms, so it's not appropriate to what's going on  
6 in the environment in which the --

7 THE COURT: Did he say they were  
8 separate?

9 MR. COFER: Yes.

10 THE COURT: I don't know if he said  
11 separate. Aside from that, I really don't want to  
12 get into it with him as to what his condition was or  
13 anything else.

14 MR. ROSENBLATT: No, no. He's not a  
15 plaintiff. He's not a plaintiff, and he doesn't  
16 have -- it was all temporary. He doesn't have the  
17 condition, any kind of permanent position. It was  
18 an annoyance.

19 THE COURT: What did he suffer from?

20 MR. ROSENBLATT: He had to put on the  
21 oxygen mask. It was all temporary. As soon as he  
22 got out of the area of smoke, he was fine.

23 THE COURT: Let's put it this way.

24 MR. ROSENBLATT: No disease.

25 THE COURT: I said earlier that he  
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1 could come in and testify that smoke bothered him,  
2 so he went out to see how it gets exhausted and he  
3 took the picture. That's basically what he's  
4 supposed to testify.

5 MS. ROSENBLATT: Let me make one  
6 comment. I believe that -- what Mr. Moss said is  
7 not my understanding. We're not going to have  
8 testimony of diseases, but certainly the class  
9 representatives, and we have listed them, will  
10 testify as to the condition of smoking on an  
11 airplane. He was on airplanes. He flew them for  
12 many years. He has firsthand knowledge of the  
13 condition of smoking and --

14 THE COURT: That's another matter  
15 totally differently. They are concerned he's going  
16 to say "I had emphysema" or --

17 MS. ROSENBLATT: No, no. It bothered  
18 him.

19 MR. COFER: Here's the problem. He was  
20 in a cockpit and he doesn't like smoking, and he had  
21 a captain smoking and someone else smoked, and so he  
22 pulled down the mask and used oxygen --

23 MR. ROSENBLATT: I'm not getting into  
24 that.

25 MR. COFER: -- so they wrote a report  
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1 for insubordination.

2 MS. ROSENBLATT: We are not getting  
3 into that.

4 MR. COFER: I don't want any of that.  
5 The cockpit and his situation is different.

6 THE COURT: I know you guys are going  
7 off the deep end. That's the trouble with  
8 depositions; you know too much.

9 MR. COFER: I don't want him to blurt  
10 that out.

11 THE COURT: Nine times out of ten  
12 because it's in the depo doesn't mean it's going to  
13 come in in trial. So, you can lead him into the  
14 fact he didn't like the cigarette smoke, it bothered  
15 you, and so you went outside and took pictures.

16 MR. COFER: Nothing about the  
17 conditions, nothing about the mask.

18 MR. ROSENBLATT: About what?

19 MR. COFER: Nothing about the  
20 conditions, nothing about the mask.

21 MR. FURR: And not being able to use  
22 the radio.

23 THE COURT: Come on.

24 MR. FURR: That's what he's going to  
25 testify to. It was so smoky, he couldn't use the

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1 radio.

2 MR. MOSS: We are going to get into it  
3 because he's going to blurt it out.

4 THE COURT: Blurt what out? That's  
5 what I thought related --

6 MR. MOSS: No. He needs a minute with  
7 him to get him outside and tell him.

8 MS. ROSENBLATT: He couldn't talk about  
9 the condition of smoking, Your Honor, in the plane.  
10 He's going to talk about that through his  
11 experience.

12 MR. ROSENBLATT: And also in the  
13 cockpit because my experience --

14 THE COURT: He can say they smoked in  
15 the cockpit and it bothered him, so he took  
16 pictures.

17 MS. ROSENBLATT: And you will lead him  
18 to that so we won't get into suffering.

19 MR. FURR: Just a minute.

20 THE COURT: Come on, guys. How much  
21 does this mean in the overall view?

22 MR. MOSS: All I'm suggesting is if he  
23 doesn't instruct him on this, we're going to get  
24 into a problem and he's going to blurt it out.

25 THE COURT: Blurt what out?

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1 MR. ROSENBLATT: He doesn't have the  
2 disease.

3 MR. FURR: He's going to blurt out the  
4 oxygen mask and not being able to use the radio.

5 THE COURT: Why is he going to do that,  
6 because he did it on depo?

7 MR. MOSS: Because I think he wants to.

8 MR. FURR: He has been very interested  
9 in this for many years is why he's going to do it.

10 THE COURT: So, you lead him. I'll let  
11 you lead him so you can avoid that.

12 MR. MOSS: Okay.

13 (The following proceedings were held within  
14 the hearing of the jury:)

15 BY MR. ROSENBLATT:

16 Q. This is going to be a very self-limiting  
17 question. I just want to establish the reason that  
18 you had for taking these photographs was because the  
19 smoke in the airplanes bothered you and you wanted  
20 to take these photographs; was that the basic  
21 reason?

22 A. Yes, that is correct.

23 Q. Okay. As a pilot before smoking was banned  
24 on the airplanes in 1990, other than at the outflow  
25 valves, did you ever notice evidence of smoke in any

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1 other area of the plane, instrumentation, wiring or  
2 any other part?

3 A. Well, the most visible evidence of it was at  
4 night. If there was another pilot in the cockpit  
5 smoking, which there almost always was because in  
6 those years all the pilots smoked, we have a map  
7 light above us right above there, shines down on the  
8 maps trying to read our navigation maps at night.  
9 Most of the other lighting in the cockpit is very  
10 dim. We have instrument lighting which is dim.  
11 This, of course, is to maximize our night vision.

12 This little lamp map light is a white light,  
13 and when I would turn it on to shine on my map,  
14 there would be a virtual cone of white smoke in  
15 front of me.

16 Q. That you could actually see?

17 A. Oh, the particulate matter was so thick, it  
18 was almost tangible like you could almost touch this  
19 white cone of smoke. And it was so visible, it was  
20 that thick in the cockpit for instrumentation.

21 The most noticeable complaint we had from  
22 passengers was about the pressurization system --

23 MR. MOSS: Objection, Your Honor.

24 MR. FURR: Objection, hearsay.

25 THE COURT: Overruled. I haven't heard  
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1 anything yet.

2 Go ahead.

3 THE WITNESS: As passengers would  
4 depart the aircraft, I would usually say goodbye at  
5 the cockpit door, and they would complain about --

6 MR. MOSS: Objection.

7 MR. FURR: Same objection.

8 THE COURT: Overruled.

9 THE WITNESS: They would complain about  
10 their ears hurting and I would say, well, we'll have  
11 to write up the pressurization system, which we  
12 could do as erratic because it would create pressure  
13 bumps.

14 That valve I showed you a moment ago needs  
15 to move very slowly and smoothly because it's  
16 handling a massive amount of air. If it goes jerky,  
17 it creates pressure bumps inside the airplane and  
18 you feel them because your ears are very sensitive.

19 So, we would write up the pressurization as  
20 erratic, creating pressure bumps, and the mechanics  
21 would come out to the airplane with a pump-up spray  
22 can with a solvent and they would go back and spray  
23 that solvent into that hole I showed you all along  
24 the outflow valve parts to dissolve that sticky  
25 substance off of the parts so that it would once

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1 again move smoothly. And it would for a while, a  
2 week or so, and then it would start to become  
3 erratic again.

4 One other place that I personally had seen  
5 it is in order to control the temperature back in  
6 the cabin to keep the passengers comfortable, there  
7 was several temperature probes situated in a couple  
8 different places back in the cabin, usually up on  
9 the overhead edge of the bin or the overhead  
10 compartment, and it was a little square screen about  
11 an inch and a half square behind which was the  
12 temperature probe. And that little screen would get  
13 clogged up so the air couldn't flow across the  
14 temperature probe correctly, and we would be  
15 constantly getting calls from the flight attendants,  
16 it's too hot, it's too cold. And we would be trying  
17 to make the adjustments, but the adjustments weren't  
18 taking because we weren't getting good information  
19 from that information probe because it was clogged  
20 up with dust, debris, tars, whatever, on that  
21 screen.

22 And then the other possibility to do with  
23 the pressurization system is the pressurization  
24 controller was what sent the signals to that valve  
25 that I showed you in the picture, and it would have

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1 air passing through it. It was taking its  
2 measurements that way and detecting the pressure  
3 inside the airplane versus the pressure outside the  
4 airplane, and that's how it would make its  
5 adjustments. And those screens in that black box,  
6 as it were, that pressurization computer, would get  
7 clogged up and then it was less sensitive and  
8 wouldn't respond to our inputs.

9 Q. Let me ask you this: Were there ever  
10 occasions, if the cabin were to have gotten smoky  
11 and you wanted to relieve that situation, what could  
12 the pilots do?

13 A. Depends on the aircraft type. On the 727,  
14 the best we could do was to turn on what we call the  
15 Gasper fan which was an additional fan motor in the  
16 air conditioning ducts, and it made air blow out of  
17 those little overhead -- we call them eyeball vents  
18 that you could open up so you could get fresh air on  
19 your face, and we could do that.

20 Now, this 757 and DC-9 doesn't have that.  
21 On a 757, we have an option and, in fact, we have a  
22 procedure in our manual that whenever we get a  
23 complaint from the flight attendants and/or the  
24 passengers -- well, it would originate with the  
25 passengers usually -- flight attendants would relay

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1 that to us, that the cabin air quality was inferior  
2 because it was too smoky in the back, and we can  
3 turn off one of our recirculation fans on the 757.

4 Now, what that does -- maybe I should back  
5 up just a little bit. There's two very different  
6 types of pressurization slash ventilation systems  
7 that old airplanes like the 727, DC-9, DC-8, old  
8 type ventilation system was, in a sense, better from  
9 a passenger standpoint than what we have today in  
10 the newer aircraft because today we recirculate some  
11 of that air.

12 In the old-fashioned kinds, the air came  
13 into the airplane from off the engines, went through  
14 the cabin one time and it was exhausted out that  
15 outflow valve in the picture.

16 In the newer aircraft, 757, 777, 767, it  
17 comes in the airplane like usual but with our  
18 recirculation system, we now can bleed -- not bleed  
19 the engines, but make that air go round and round  
20 repeating its circulation through the aircraft  
21 before it goes out the outflow valve.

22 So, it's more efficient from the standpoint  
23 of fuel consumption but actually provides the cabin  
24 with a poorer air quality.

25 Q. Mr. Fulton, since smoking has been banned on

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1 airplanes in 1990, do you see this anymore?

2 A. Not a sign of it. It's absolutely gone.  
3 The skin behind the outflow valve now is whistle  
4 clean.

5 MR. ROSENBLATT: Thank you very much.

6 THE COURT: Any cross?

7 MR. FURR: Yes, sir.

8 CROSS EXAMINATION

9 BY MR. FURR:

10 Q. Hi, Mr. Fulton. We never met. I'm Jeff  
11 Furr. I'm the attorney who represents R.J.  
12 Reynolds.

13 You are a pilot, sir, is that correct?

14 A. Yes, sir.

15 Q. You never attempted to measure how much  
16 environmental tobacco smoke was in the cockpit or in  
17 the cabin where the flight attendants worked, did  
18 you?

19 A. No, sir.

20 Q. You never asked anyone else to do that for  
21 you, did you?

22 A. No.

23 Q. A moment ago, in your response to  
24 Mr. Rosenblatt's questioning, you were discussing  
25 the ventilation systems aboard aircraft, and you

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1 were explaining the differences between one-pass  
2 ventilation and recirculation.

3 Do you recall that?

4 A. Yes, sir.

5 Q. Did you tell us that the older planes  
6 primarily use the one-pass ventilation type system?

7 A. That's right.

8 Q. And up until what point in time was the  
9 one-pass system used?

10 A. It still is.

11 Q. It still is?

12 A. Sure. On all those airplanes that are still  
13 flying, and most of them still are.

14 Q. I believe you told us you flew for Eastern  
15 on Electras, 727s and DC-9s, is that correct?

16 A. That is correct.

17 Q. And all those aircraft have one-pass  
18 ventilation systems?

19 A. Yes.

20 Q. And so, the air comes in, flows through the  
21 cabin one time, and is exhausted and replaced by  
22 fresh air again?

23 A. That's right.

24 Q. And in fact, at least for the 727 and DC-9,  
25 that happened over 20 times per hour, is that

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1 correct?

2 A. I don't know that.

3 Q. You are not familiar with the ventilation  
4 rates?

5 A. No. We learn how the system operates, but  
6 we don't get those kind of numbers.

7 Q. You do know why manufacturers of airplanes  
8 began introducing recirculation systems, don't you?

9 A. I think I do.

10 Q. Why is that?

11 A. Fuel efficiency.

12 Q. And in fact, they were pressured by the  
13 airlines to achieve greater fuel efficiency, and one  
14 of the ways they have done that is introduced  
15 recirculation systems?

16 A. Correct.

17 Q. And there is a trade-off, isn't there,  
18 between fuel efficiency and quality of air -- and  
19 air quality in the airline cabin?

20 A. Yes.

21 Q. The more you recirculate air, the worse the  
22 quality of the air in the cabin is; is that correct?

23 A. If foreign contaminants are introduced.

24 Q. Excuse me?

25 A. If foreign contaminants are introduced,

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1 that's true.

2 Q. Now, a moment ago you testified that from  
3 time to time you would receive complaints from the  
4 flight attendants about the level of smoke in the  
5 airliner cabin, is that right?

6 A. That's right.

7 Q. And you indicated that one of the measures  
8 that you could take as a member of the cockpit crew  
9 was to -- did you call them Gaspers?

10 A. Gasper fan.

11 Q. Now, there are other measures you could take  
12 too, aren't there?

13 A. Depending on the airplane type.

14 Q. Well, all airplanes have no smoking lamps  
15 that can be turned on by the cockpit crew, don't  
16 they?

17 A. That's true. A very unpopular thing when  
18 smoking was permitted.

19 Q. But in fact, that was an option the cockpit  
20 crew had, wasn't it?

21 A. It was, and it was not recommended by the  
22 company nor was it ever used.

23 Q. So, the airline companies that you worked  
24 for recommended that you not turn on the no smoking  
25 lamp?

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1       A.    There was no policy for it.  They did not  
2   address that, but it was never recommended as a way  
3   to clear the air in the cabin.  Now, occasionally  
4   some of us took it upon ourselves to do that when we  
5   had no other recourse.

6       Q.    And in fact, in an airliner with one-pass  
7   ventilation in which the air was exchanged 20 times  
8   an hour, if that's correct, turning on the no  
9   smoking lamp, assuming that everybody complied,  
10   would result in a one hundred percent exchange of  
11   that air in about three minutes, wouldn't it?

12      A.    If those numbers are true.  But I have my  
13   doubts because these airplane -- those numbers, if  
14   they are accurate, were generated on a brand new  
15   airplane with everything operating at brand new  
16   operational specifications.

17            It didn't take very long in service before  
18   those specs were probably not reached, because the  
19   air would not clear in three minutes.  I know that  
20   for a fact because I saw it happening in the  
21   cockpit.

22      Q.    So, the airlines simply weren't able to  
23   maintain their ventilation systems to specs; is that  
24   what you are telling us?

25      A.    Well, you know, there's ordinary wear and

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1 tear. Compressor blades begin to wear, and the  
2 system simply is not as efficient. Filters get  
3 clogged up. Because that air, though, is one-pass,  
4 it does go through filters and they get clogged up  
5 with foreign matter and they are less efficient as  
6 well.

7 Q. The reason you have filters is so they can  
8 filter foreign matter out of the air?

9 A. Mm-hmm.

10 Q. You have to answer out loud.

11 A. Yes.

12 Q. And as a member of the cockpit crew, you, in  
13 fact, on occasion, did turn on the no smoking lamp  
14 in response to flight attendants' complaints about  
15 the level of smoking in the cabin, didn't you?

16 A. That's right.

17 MR. FURR: Thank you, sir.

18 THE COURT: Any redirect?

19 MR. ROSENBLATT: Very brief.

20 REDIRECT EXAMINATION

21 BY MR. ROSENBLATT:

22 Q. In terms of the complaints by flight  
23 attendants and in terms of the cabin getting real  
24 smoky, before smoking was entirely banned on  
25 domestic flights in this country, was there any

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1 hundred percent solution to cure the problem that  
2 you were ever aware of?

3 A. None. No. There was just -- the volume of  
4 smoke was too heavy. We couldn't get rid of it  
5 except with his suggestion, and as I did a couple  
6 times turn the no smoking section on.

7 Q. That was an action you took pretty much on  
8 your own?

9 A. Definitely on my own. It was not  
10 recommended by the company. It just wasn't  
11 addressed by the company, but there were times when,  
12 on the 727, I almost couldn't see the back of the  
13 airplane the smoke was so thick back there. And to  
14 get the flight attendants some relief, I'd turn the  
15 no smoking sign on for a while, simply explain to  
16 the passengers over the P.A. the ventilation system  
17 is not capable of handling this quantity of smoke  
18 and we are going to have to stop smoking for a while  
19 and later I'll turn it back off again.

20 Q. And you did; you did turn it back on?

21 A. Yes.

22 MR. ROSENBLATT: Thanks a lot.

23 THE COURT: You may step down. Thank  
24 you very much.

25 (The witness was excused.)

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1 THE COURT: Short conference just for  
2 scheduling.

3 (An off-the-record bench conference was held  
4 outside the hearing of the jury.)

5 THE COURT: All right, folks.  
6 Apparently, we will not need your services after  
7 4:15, which it's now 4:15, so we'll send you home.  
8 Come back tomorrow. Please gather down there at  
9 nine. All get together, then come up here and wait  
10 up here.

11 Now, normally speaking, what generally  
12 happens is, when we convene at nine o'clock, there's  
13 always a lot of things that we have to do that don't  
14 require your presence, and we usually take that  
15 time, it sometimes takes an hour, sometimes less.  
16 But as long as you are comfortable up here, that's  
17 fine with me.

18 So, if we don't get to you exactly at nine  
19 or 9:30, that's because we're working.

20 Okay. Same rules apply.

21 (The jury exited the courtroom.)

22 THE COURT: Okay. Today is Thursday.

23 MR. ROSENBLATT: Yes.

24 THE COURT: What have you got for  
25 tomorrow?

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1 MS. ROSENBLATT: We have two live  
2 witnesses that probably won't be that long. One on  
3 ventilation, Mr. Halfpenny, Paul Halfpenny, and the  
4 other is a Dr. Roggli, and we're trying to avoid any  
5 kind of cumulative, so we're limiting --

6 THE COURT: A doctor of what?

7 MS. ROSENBLATT: He's a pathologist.  
8 He practices at Duke. We had designated portions of  
9 the deposition of William Ray Morgan. We would like  
10 to play that tomorrow afternoon. I haven't gotten  
11 any objections from defense counsel. I don't know  
12 if there are any or cross designations but, you  
13 know, we want to be in a position to do that  
14 tomorrow.

15 MR. HARDY: That's unlikely if you are  
16 going to do the two witnesses you are talking about,  
17 because we have extensive objections to the -- but I  
18 would think we would deal with those after a few  
19 minutes.

20 MS. ROSENBLATT: I don't think the two  
21 witnesses will take more than the morning. We also  
22 have the designated -- there are quite a few  
23 depositions that there are limited portions we need  
24 to read, from the Council for Tobacco Research, and  
25 various, a couple of videos, portions.

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1           There have been objections and cross  
2     designations, so we have all of that to take up.  
3     But that's obviously---

4           THE COURT:   So what we anticipate then  
5     is, let's say a morning for the jury and the  
6     afternoon basically for us.  Is that it?

7           MS. ROSENBLATT:  Depending upon the  
8     extent of cross examination.  Unless there is a  
9     video they can tell us they have no problem with,  
10    that we could---

11          The one we could do is now, perhaps, or  
12    first thing -- well, the morning, the jury would be  
13    waiting.

14          Doctor Spears we had designated that we have  
15    the objections, and that video could conceivably be  
16    edited overnight so we can play that in the  
17    afternoon, unless we---

18          THE COURT:  How much does that involve?

19          MS. ROSENBLATT:  I think it's fairly  
20    extensive.  It's a long deposition.

21          MR. ROSS:  Fairly extensive objections.

22          MS. ROSENBLATT:  Objections.

23          THE COURT:  How many pages is that  
24    wonderful deposition?

25          MR. ROSS:  200 something.

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1 MS. ROSENBLATT: It's ours. Usually  
2 they are not too long.

3 THE COURT: Short. Only a six-hour  
4 one.

5 MR. MOSS: Exactly.

6 THE COURT: Well, do you want to start  
7 now?

8 MR. ROSENBLATT: I am just a little  
9 concerned that if we reach a point where the, you  
10 know, the jury is here, that we have something to  
11 do.

12 MS. ROSENBLATT: What I think would  
13 probably make sense is to spend tomorrow afternoon  
14 going over all the objections, including Ray Morgan,  
15 so next week it could just flow smoothly.

16 THE COURT: I would like to do that.

17 MS. ROSENBLATT: Tomorrow afternoon  
18 might be sufficient to do all of that, so they would  
19 be here. That way, just concluding -- because there  
20 was a mention of perhaps the defense bringing in  
21 Dr. Spears on their case if we didn't play it, so we  
22 have got to discuss that ourselves. I don't want to  
23 do this if it's not going to go anywhere, if we are  
24 going to take them up on that---

25 MR. HARDY: You remember a couple weeks

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1 ago, back when we were first getting started, Your  
2 Honor, the question came up, I think Mr. Rosenblatt  
3 or Mrs. Rosenblatt raised the question, would the  
4 defense promise to bring any CEOs in their case in  
5 exchange for the plaintiff not playing videos. And  
6 I had said, no, we won't make that promise.

7 And I told them today that with respect to  
8 Dr. Spears, if they were still interested in that  
9 proposition, then I had only to make a phone call to  
10 ensure that I could make that promise, but for  
11 whatever reasons, I think they were or are not  
12 interested in that, so---

13 MS. ROSENBLATT: We're not sure. You  
14 know, I also would like to, on our case, certain  
15 elements and certain things we want in. Plus, I  
16 have already invested three or four hours going  
17 through all of it. But we may end up agreeing on  
18 it. We have to discuss that tonight, amongst other  
19 things.

20 THE COURT: Let's see if we can put all  
21 that together for tomorrow. If we can avoid having  
22 to go through 300 pages of deposition, wonderful.  
23 If it isn't going to work out, well, then we will  
24 just take the time to do it.

25 MR. HARDY: I just -- it doesn't make a

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1 lot of difference to me either way except that I am  
2 not -- just so I don't appear to be sandbagging  
3 anybody, I am not willing to enter into some  
4 in-between situation where they play part of a --  
5 it's either all or nothing.

6 THE COURT: I understand.

7 MR. ROSENBLATT: We have been talking  
8 to each other, Judge, in terms of an estimate---

9 THE COURT: Time-wise?

10 MR. ROSENBLATT: I think the likelihood  
11 is that we will finish our case by the end of next  
12 week. I don't think we will need to go into the  
13 following---

14 MS. ROSENBLATT: I think the defense  
15 was going to advise you, Your Honor, as to how long.  
16 I don't have any idea how long they feel their case  
17 is going to be.

18 THE COURT: Assuming they are finished  
19 at the end of next week, what do you figure?

20 MR. COFER: A lot of it depends on who  
21 they put on.

22 THE COURT: You know who they are going  
23 to put on.

24 MR. COFER: Not next week.

25 MS. ROSENBLATT: Steve Carr, David  
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1 Carr, Johnson, Cummings. I basically told you  
2 everyone I am aware of. And we are going to try to  
3 get on Jesse Steinfeld, and you know the depositions  
4 I have designated. We have some more to---

5 MR. COFER: Is Celermajer---

6 MS. ROSENBLATT: I am not sure if we  
7 are going to be reading portions of it.

8 MR. COFER: Celermajer, we are going to  
9 use the discovery deposition?

10 MS. ROSENBLATT: I'm not sure.

11 MR. ROSENBLATT: Probably.

12 MS. ROSENBLATT: I have to see if there  
13 is a portion we can read.

14 MR. COFER: That's what we need to  
15 know. We talked about Celermajer not going forward  
16 in our case.

17 THE COURT: I understand.

18 MS. ROSENBLATT: How does that impact  
19 on the witnesses you are going to call? I just want  
20 to have an idea.

21 MR. HARDY: Three weeks is a guess.  
22 That's all it is. It's the best guess we can make  
23 now.

24 THE COURT: All right. So you take a  
25 week, you take three. That's another month, which

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1 would be the month of August.

2           Okay. Barring any unforeseen unnatural  
3 occurrences, knock on wood, then we are going to  
4 have to spend a lot of time on trying to get some  
5 jury instructions. That's going to take a long  
6 time. All right.

7           All right. Keep that in mind, okay?

8           MR. ROSENBLATT: Thank you, Judge.

9           (The proceedings were adjourned at 4:25  
10 p.m.)

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